

100th Congress
1st Session

JOINT COMMITTEE PRINT

S. PRT. 100-57
VOL. 2

GORBACHEV'S ECONOMIC PLANS

VOLUME 2

STUDY PAPERS

SUBMITTED TO THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES



NOVEMBER 23, 1987

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE

75-891

WASHINGTON : 1987

For sale by the Superintendent of Documents, Congressional Sales Office
U.S. Government Printing Office, Washington, DC 20402

J842-19

JOINT ECONOMIC COMMITTEE

[Created pursuant to sec. 5(a) of Public Law 304, 79th Congress]

SENATE

PAUL S. SARBANES, Maryland,
Chairman
WILLIAM PROXMIRE, Wisconsin
LLOYD BENTSEN, Texas
EDWARD M. KENNEDY, Massachusetts
JOHN MELCHER, Montana
JEFF BINGAMAN, New Mexico
WILLIAM V. ROTH, JR., Delaware
STEVE SYMMS, Idaho
ALFONSE M. D'AMATO, New York
PETE WILSON, California

HOUSE OF REPRESENTATIVES

LEE H. HAMILTON, Indiana,
Vice Chairman
AUGUSTUS F. HAWKINS, California
DAVID R. OBEY, Wisconsin
JAMES H. SCHEUER, New York
FORTNEY H. (PETE) STARK, California
STEPHEN J. SOLARZ, New York
CHALMERS P. WYLIE, Ohio
OLYMPIA J. SNOWE, Maine
HAMILTON FISH, JR., New York
J. ALEX McMILLAN, North Carolina

JUDITH DAVISON, *Executive Director*
RICHARD F. KAUFMAN, *General Counsel*
STEPHEN QUICK, *Chief Economist*
ROBERT J. TOSTERUD, *Minority Assistant Director*

CONTENTS

VOLUME 2

VI. AGRICULTURE

	Page
Overview—Carl W. Ek	1
Reform and Resource Allocation in Soviet Agriculture—Kenneth R. Gray	9
Gorbachev's Agricultural Policy: Building on the Brezhnev Food Program— Penelope Doolittle and Margaret Hughes	26
Solving the Soviet Livestock Feed Dilemma: Key To Meeting Food Program Targets—Barbara S. Severin	45
Soviet Agricultural Transport: Bottlenecks To Continue—Judith Flynn and Barbara Severin	62
The Nutrient Content of the Soviet Food Supply and Comparisons With the U.S. Food Supply—Ann M. Lane, Ruth M. Marston, and Susan O. Welsh	79
Raising the Efficiency of Soviet Farm Labor: Problems and Prospects—Ann Goodman, Margaret Hughes, and Gertrude Schroeder	100
Commentary—D. Gale Johnson	126
Commentary—Karl-Eugen Waedekin	130

VII. TECHNOLOGY AND SCIENCE POLICY

Overview—George Holliday	141
Soviet Science and Technology Strategy: Borrowing From the Defense Sector—Paul Cocks	145
The Soviet Information Revolution: Some Prospects and Comparisons—Rich- ard W. Judy	161
The Prospective Impacts of Computing: Selected Economic-Industrial-Strate- gic Issues—S.E. Goodman	176
The Integration of Management Information Systems in Soviet Enterprises— William K. McHenry	185
The Computer Literacy Program: Problems and Prospects—Peter B. Nyren	200
Commentary—Hans Heymann, Jr.	209

VIII. CONSUMPTION AND INCENTIVES

Overview—Jean Farneth Boone	219
Gorbachev's "Human Factor" Policies—Elizabeth Teague	224
U.S.S.R.: Toward the Service Economy at a Snail's Pace—Gertrude E. Schroe- der	240
Gorbachev's Policy on the Private Sector: Two Steps Forward, One Step Backward—Roger Blough, Jennifer Muratore, and Steve Berk	261
The Brigade System of Labor Organization and Incentives in Soviet Industry and Construction—Meredith M. Heinemeier	272
Soviet Residential Housing: Will the "Acute Problem" Be Solved?—Michael V. Alexeev	282
Gorbachev's Anti-Drinking Campaign: A "Noble Experiment" or a Costly Exercise in Futility?—Vladimir G. Tremi	297
Developments in the Health Sector of the Soviet Economy, 1970-90—Christo- pher Mark Davis	312
Commentary—David Granick	336
Commentary—Peter Hauslohn	344

IV

IX. REGIONAL DEVELOPMENT, TRANSPORT, AND THE ENVIRONMENT

	Page
Overview—Donna L. Gold.....	353
Siberian Development Under Gorbachev—Theodore Shabad.....	357
Regional Planning: The BAM and the Pyramids of Power—Victor L. Mote.....	365
Transport Pressures and Potentials—Holland Hunter and Vladimir Kontorovich.....	382
Gorbachev, Economics and the Environment—Craig ZumBrunnen.....	397
Commentary—Robert G. Jensen.....	425

X. FOREIGN ECONOMIC RELATIONS

Overview—William H. Cooper.....	429
U.S. Policy Governing Economic and Technological Relations With the U.S.S.R.—Gary K. Bertsch.....	433
U.S.-Soviet Trade Trends—Hertha W. Heiss.....	448
The U.S.S.R.'s Hard Currency Trade and Payments Position—Joan F. McIntyre.....	474
Soviet Efforts To Revamp the Foreign Trade Sector—Joan F. McIntyre.....	489
Soviet Trade With LDC's—Marie Lavigne.....	504
Moscow's Economic Aid Programs in Less-Developed Countries: A Perspective on the 1980's—Carol Fogarty and Kevin Tittle.....	532
Commentary—Roger E. Kanet.....	542
Commentary—Charles Wolf, Jr.....	550
Commentary—Heinrich Vogel.....	556

VI. AGRICULTURE

OVERVIEW

By Carl W. Ek*

Introduction

The creaky agricultural system inherited by Mikhail Gorbachev when he assumed the USSR's top leadership post in 1984 was, to most observers, in great need of repair. Because Gorbachev's background was in agriculture—he was named as supervisor of the Central Committee's national policy for agriculture in 1978—he probably understood better than many senior Soviet officials the need for reform in that sector. Gorbachev has recognized agricultural problems on both the domestic and the trade sides.

On the domestic front, Soviet agriculture lays claim to more of some economic resources—land, labor, and capital—than does American agriculture. As authors Judy Flynn and Barbara Severin note:

The agricultural sector in the USSR is immense, currently claiming roughly one-third of total annual investment (including housing and services) and employing nearly 30 percent of the labor force. Farm production alone claims about 20 percent of annual investment and of the labor force in comparison with less than 5 percent for each in the United States. Moreover, the USSR farms about one-third more land than does the United States, but the value of output per hectare in the USSR averages only 56 percent of that in the United States.

This problem of productivity on the domestic side is a reflection of difficulties on the trade side as well. Once a significant exporter of grain and other food products, the Soviet Union in the last few decades has become one of the world's largest importers of agricultural commodities. This reversal was not only an embarrassment for the Soviet government; it was mute testimony that its economic system was inadequate even to feed its own citizens. In addition, large imports of food and feed grains have been a serious drain on the country's precious hard currency reserves.

Background and Policy Response

In their paper, authors Penelope Doolittle and Barbara Severin explain that Soviet agriculture has suffered from a number of problems that have nothing to do with climate, soil fertility, or other growing conditions; the stumbling blocks are numerous:

- The Soviet bureaucracy, a large and unwieldy one, meddles in the affairs of farm managers; bureaucrats are resistant to

*Analyst in Agricultural Policy, Congressional Research Service.

- change—especially changes which may diminish their influence.
- Labor incentives are lacking; i.e., wages are not commensurate with productivity.
 - Soviet infrastructure—especially roads and storage facilities—is poor.
 - Rural housing and the general quality of life in farming areas are below standard.
 - There is deficient performance in the industrial sectors which provide critical inputs for agriculture.

The 1982 Food Program introduced during Leonid Brezhnev's tenure attempted to address some of these problems through a system of "unified management," through increased investment in storage and processing, and through the introduction of economic incentives for higher productivity. But, according to the authors, Brezhnev's food program was flawed by excessive compromises to the bureaucracy and by insufficient flexibility for pricing and decisionmaking. Gorbachev, a major architect of the 1982 Food Program, reportedly knew that the plan was insufficient, but had to tread lightly during the reigns of Andropov and Chernenko. It came as no surprise that, upon assuming the office of General Secretary in 1984, Gorbachev assigned a high priority to the task of making Soviet agriculture more efficient and thereby reducing government spending on the farm sector. His three-part approach to this endeavor is to entail: (1) Shifting government investment from farms to secondary industries up- and downstream from farming; (2) improving government structure to better synchronize elements of the food chain; and (3) strengthening economic incentives to improve efficiency.

A new emphasis on investment is central to Gorbachev's agricultural policy. However, Gorbachev has indicated he does not intend to increase the overall level of government spending, but rather to restructure or shift around investment. One of Gorbachev's chief strategies has been to increase efficiency through reducing waste; he reasons that it would cost less for the government to prevent such losses than to invest in production increases sufficient to offset losses. Author Ken Gray notes that "preserving more of what farms produce could cost one-third to one-half as much as producing more at the farm level."

A second component of Gorbachev's farm policy is his effort to streamline the bureaucracy. Authors Doolittle and Hughes believe the General Secretary regards the Soviet civil service as a barrier to his reforms. The bureaucracy has, for example, reportedly blocked the effective establishment of district commissions (RAPOs) over central ministries.

Gorbachev used a liberal interpretation of the 1982 Food Plan to justify the establishment of a central coordinating organization and to strengthen the authority of RAPOs. In 1985, the USSR State Agroindustrial Committee (Gosagroprom) was created. Gosagroprom is aimed at making the entire "input-production-processing chain" work efficiently through ending bureaucratic vested interests which cause elements in the food chain to be out of sync. In streamlining the central bureaucracy, Gorbachev reduced adminis-

trative staff by 47 percent; decisionmaking under Gosagroprom, should be shifted closer to the local level.

Gorbachev has said that it is not enough for RAPOs to have greater autonomy; incentives—the third and most problematic element of Gorbachev's new plan, are necessary. Self-financing, which requires "enterprises to finance their operations out of their own revenues," is regarded as the major incentive for managers. Doolittle and Severin believe self-financing can have only limited success, given constraints beyond the farm gate. The lack of an efficient pricing system also stymies farm managers from financing their operations in a "profitable" manner.

A March 1986 decree on agricultural management is also presumed to act as an incentive by giving farms freedom over the disposal of above-plan production, and permitting them to sell perishables at market-influenced prices; in addition, localities are allowed to exchange food. The decree, according to Doolittle and Hughes, is not as bold as it seems; they question whether it will raise production levels. At best, they believe, the decree should help reduce losses, improve distribution, and increase local food availability.

Overall, the authors believe Gorbachev's reforms will take time to implement and will have limited success. Neither the restructuring of management nor the shifts in investment can take place overnight. In addition, state agricultural subsidies will likely remain steep due to continued high minimum wages and support for unproductive farms; these inefficiencies will lead to higher procurement prices.

Notwithstanding these problems, Doolittle and Hughes believe Gorbachev's reforms could lead to higher consumption, lower imports, and perhaps to more radical changes in the Soviet system.

Raising the Efficiency of Soviet Farm Labor

The Soviet agricultural work force has historically suffered from low productivity—estimated at between 10 and 25 percent that of U.S. farm labor. Ann Goodman, Margaret Hughes, and Gertrude Schroeder survey the most recent Soviet attempts to boost the efficiency of their agricultural labor force. These efforts, stretching back over a decade, have focused on minor adjustments in the wage and bonus system, increased investment in rural infrastructure, resettlement schemes, non-monetary incentives to attract skilled workers, and collective contracts.

Gorbachev's reforms will likely retain most of these initiatives, with special emphasis on stepped-up investment in rural infrastructure. The authors believe, however, that prospects for success are dim because (1) investment will fall short of rural community needs—talented young people will continue to flee the farms; (2) the inefficient economic system will prevent timely delivery of appropriate equipment; and (3) self-financing and collective contracts will not function in a centrally-planned system where prices do not reflect supply and demand. In short, the authors conclude, "some progress may be made, [but] the many measures intended to accord priority to improving the living conditions of farm workers—and thus hopefully their work attitudes—are likely to founder on the shoals of insufficient investment."

Focus on Transportation

In keeping with his strategy of reducing post-harvest losses, Gorbachev has planned to concentrate resources in areas responsible for the greatest amount of loss, such as storage and transportation. Authors Judith Flynn and Barbara Severin state that up to 20 percent of the USSR's agricultural output is lost each year as a result of the country's poor transportation and storage system; that 20 percent loss, they also note, is equal to approximately 90 percent of the annual imports of agricultural goods by the Soviet Union.

In the past, agriculture has had a preferential claim on the Soviet transportation network, a claim which the authors characterize as burdensome. Agricultural commodities require special handling: grain can be combustible, and fruits and vegetables are perishable; in addition, trucks and railcars must be kept clean to avoid contamination of food and feed. The demand for agricultural transportation, moreover, is highly seasonal and concentrated in traditional farming regions. Also, if reform efforts are successful and agricultural output rises, demands on the transportation network will increase.

The authors cite three main problems in the Soviet transportation sector. The lack of adequate roads, they believe, is perhaps the main reason for transportation-related loss of agricultural goods. Poor roads mean that trucks do not last as long, must be driven more slowly, require more fuel, and cannot transport full loads. The need for improvement in rural roads applies not just to off-farm roads, but to on-farm roads as well. Some state and collective farms in the USSR cover tens of thousands of acres and support entire communities; impassable roads on these farms prevent harvested commodities from getting to markets, and keep inputs from being delivered in timely fashion to fields.

Along with bad roads, Soviet agriculture suffers from serious shortages of transport equipment. According to Flynn and Severin, the current ratio of trucks to acreage "is still somewhat less than half the number that Soviet planners consider necessary to avoid delays." There is also a shortage of railcars suitable for transporting agricultural inputs and commodities.

A third problem in Soviet agricultural transportation highlighted by the authors is the inefficient use of trucks and fuel. The lack of maintenance and repair facilities in rural areas means that vehicles spend a great deal of time out of commission while awaiting servicing. Poorly maintained trucks also burn more fuel. Finally, the development of large, central processing facilities in the USSR has resulted in farm products being shipped excessive distances. This is especially harmful for livestock.

Although Gorbachev has not yet outlined a detailed plan to address the agricultural transportation problem, he has repeatedly made reference to the issue in public appearances, indicating a commitment to tackle the problem.

Despite his stated goal of reducing agricultural imports through increasing domestic farm production, Gorbachev seems intent upon carrying on the task, initiated by his predecessors, of improving import facilities—mainly ports and grain handling equipment.

Such work is intended to expedite unloading of grain and reduce vessel demurrage.

It appears likely that Gorbachev will continue to upgrade the rail system through the acquisition of specialized rolling stock; this will include manufacture of additional hopper cars for grain, refrigeration cars for perishable commodities, and railcars capable of transporting corrosive chemicals used in agriculture.

Gorbachev probably will also have to struggle with the question of truck allocation. In the past, agriculture was given priority for trucks. In recent years, however, there has been increasing pressure for more trucks from other sectors of the economy, both civilian and military. Gorbachev's planners will therefore likely focus on truck productivity, that is, developing more fuel efficient trucks capable of carrying larger cargoes.

The authors believe that road construction is Gorbachev's greatest transportation challenge. The USSR is far behind on fulfilling its stated goals for both on- and off-farm roads. The agricultural sector reportedly suffers because republic ministries, which are responsible for road construction, tend to build roads closer to urban centers, despite apparent evidence that there is a multiplier of four for each ruble spent on farm road construction, that is, each ruble spent on farm road building generates four additional rubles in the economy. Road-building is also retarded by a shortage of construction materials such as asphalt and crushed stone.

Flynn and Severin are guardedly optimistic about the prospects for Soviet agricultural transport:

On balance, the Soviets are not likely to solve their agricultural transport problems . . . in the remaining years of the 1980s or probably the 1990s. Nevertheless, even a moderate but serious effort to expand rural roadbuilding and improve trucking and railroad service would . . . allow Moscow to slowly improve food supplies in the coming years.

1986: Test Year for Gorbachev's Agricultural Reforms

With the advent of the Brezhnev Food Programs in 1982, and with additional changes instituted by current General Secretary Gorbachev in 1985, Soviet agriculture appears to be changing course. However, despite a fairly impressive showing in 1986, Soviet agriculture continues to be plagued with the problem of inefficient resource allocation, according to author Kenneth Gray.

Soviet agricultural production in 1986 was a clear improvement over the previous five-year period. According to Gray, "[t]he Soviet measure of gross agricultural output grew by 5.1 percent over 1985, itself a good year, versus average annual growth of 1.2 percent in the preceding 11th five-year plan." Soviet authorities attribute the farming successes of 1986 to "intensive technology." In the past, the Soviets have sought to increase output through bringing additional acreage under the plow; hence, the "New Lands" program of the 1950s. The latest push, however, is intended to squeeze more bushels out of fewer acres. Gray notes that "in Russian discussions, 'intensive technology' is short for the entire assortment of farming techniques which lead to higher yields."

Banking on intensive technology, however, may prove disappointing for the Soviets in the longer run. Gray contends that intensive technology can have only limited success because of an imbalanced

supply of and excess demand for the material technical inputs necessary for optimal performance in agriculture.

The supply of various farm inputs has traditionally been erratic; an ill-timed absence of critical inputs can have serious consequences. Fertilizer, labor, tractors, combines, trucks, pesticides, etc., all must be in the right place, in the right amounts, at the right time; if they are not, bottlenecks occur and production falls because of lower yields and post-harvest losses.

Gray also notes that Soviet farm production suffers because of excess demand for inputs. He lists three reasons for this excess demand: (1) in the short run, low input prices will not equilibrate; (2) input production subsidies are below costs of production, and (3) output quotas take precedence over cost efficiency considerations.

These supply and demand problems are compounded by faulty rationing by Soviet authorities, Gray argues. He stresses the need for proper location and concentration of complementary resources. In the north-south bids for scarce inputs in the Soviet Union, politics sometimes wins out over rational economic planning; scarce fertilizer may be delivered to the Russian (RSFSR) region when it would actually do more good if it were sent to the black earth zone of the Ukraine. In addition to these problems of non-optimal location, the Soviets have a tendency to divide the resource pie equally when it would be more efficient to concentrate the delivery of complementary resources to areas where they will be most effective.

Gray believes that the continued misallocation of farm inputs will have a negative impact on the new collective contract program for farm labor. This program is intended to relate the pay status of agricultural workers to the "final product" of their work. Given the uncertainty over timely delivery of critical inputs, workers would rather receive remuneration for specific tasks—plowing a field, driving a truck, etc.—than have their pay envelopes be dependent upon harvest results.

Gray also argues that farm managers will be hamstrung by the State's continued interference in management decisions. On paper, farm managers have freedom over production decisions, so long as they meet the procurement plan. In reality, however, production decisions are determined by "tight and detailed sales plans."

A government decree issued in March, 1986, introduced a seeming degree of flexibility into the sales of certain commodities. Farms were allowed to sell privately and through cooperatives 30 percent of their procurement plan for fruits and vegetables. Also, farms were permitted to continue selling above-plan production of grain and livestock production. Evidence to date suggests that farms have not taken overwhelming advantage of these provisions. Gray intimates that farm managers may sense that, since both of the marketing incentives are linked to State-mandated production quotas, any evidence of a farm's ability to produce above plan would eventually result in quotas being raised.

Gray concludes his essay by warning that enthusiasm for the intensive technology campaign should be tempered by the realization that it can have only limited impact in the future if the problem of inadequate input supplies persists.

The Soviet Consumer: Nutrition

Although the Soviet Union does not publish comprehensive information detailing the nutritional level of its citizens' diet, authors Lane, Marston and Welsh have been able to interpolate from Soviet food supply data that the nutrient content of the Soviet food supply is similar to that of the United States. The authors found that "the Soviet food supply on an average per capita basis has long been generally adequate from a nutritional point of view."

This conclusion is based upon food supply data; it does not indicate actual consumption by households or variations of distribution. In both the USSR and the US, nutrients ingested are less than those available in the food supply because of nutrient losses (through processing, cooking, etc.) after the point of measurement.

The authors noted that, with few exceptions, the increase in the nutritional content of the Soviet diet between 1965 and 1981 was across the board. Gains were registered for protein, calories, fat, and cholesterol, while intake of vitamins and minerals for the most part held steady or increased. With the exception of calcium, the Soviet intake of vitamins and minerals is at or above the Soviet recommended dietary allowances.

The sources of nutrients have also shifted over the period studied; for example, Soviet citizens now derive a much larger portion of their protein requirements from livestock products. This increase in meat consumption is also probably responsible for increases in fat and cholesterol in the Soviet diet, and has prompted concern among some scientists that the USSR may experience an increased rate of heart disease.

The authors caution that their conclusions do not reflect variations of nutrient intake among different regions and population groups. For example, Siberians consume only about one-fourth as much fruit as Russians, a problem which can in part be attributed to the country's inadequate distribution system. This regional variation has health implications as well: in some parts of the USSR, there is evidence of diseases—especially rickets and anemia—related to dietary deficiencies.

The Soviet Consumer: A Preference for Meat

According to author Barbara Severin, the fact that Soviet citizens appear to have sufficient nutrition in their diets should not be interpreted to mean that the Soviets are generally content with their food supply. On the contrary, a thriving black market and long lines at food markets are described as sure signs of an enormous pent-up demand for a higher quality, more varied diet—especially one which includes more meat. Soviet incomes, though still far below Western standards, have risen steadily; food prices, however, have changed little since the early 1960s. The demand for quality meat products reportedly remains unsatisfied.

Author Barbara Severin speculates that Gorbachev's popularity—and, by extension, his future influence and political effectiveness—may in part depend upon his ability to satisfy the Soviet citizenry's demand for more meat in their diet.

Putting meat on the table is costly for the Soviet government. Because the cost of meat production is so high (triple the retail

price, in the case of beef), the USSR spends large amounts subsidizing meat for consumers—an estimated 19 billion rubles in 1985. Lowering the cost of production would reduce outlays for both meat subsidies and feed imports.

Severin maintains that improving the supply of appropriate feed-stuffs is the key to livestock productivity. Feed is made up of concentrates and roughages; animals benefit from a correct balance of the two. An improper ration of the two makes for uneconomical feeding practices and inefficiencies in animal growth.

In the past, in Severin's view, the Soviets have tended to overemphasize both the percentage of concentrates used and total amount of feed; this practice failed to increase livestock productivity and extracted opportunity costs from other parts of agriculture. Shifts in investment mandated by the 1982 Food Plan are intended to correct the imbalance through increasing the production of roughages.

The Soviets have also been trying to increase the protein content of their feed, but progress has been slow. In the past, they have been encouraged to import soybeans, which are high in protein, and which may not be grown in large quantities in the Soviet Union. But they have not gone this route, perhaps because they lack proper handling and blending facilities.

For the past twenty years, the Soviets have been developing a single-cell protein (SCP) industry. Although the initial costs were high, the Soviets believed the industry would pay for itself over the long run because SCP is independent of climate, is easy to handle and store, obviates the need for imports, and because SCP may be a more efficient protein than oilseed meal.

The Soviets plan to increase their total feed supply to 540-550 million tons by 1990, up from an average of 420 million tons during the period 1981-85. Author Severin believes that even the lower end of this goal is unlikely; she argues that the high levels are set "primarily to exert pressure on managers." But these high levels may not be necessary because livestock targets have been lowered and because other uses of grain may decrease.

During the current Five Year Plan, the Soviets plan to reduce the concentrate share of feed; production should advance, thus reducing the need for imported grain by 1990. The 1982 Food Plan emphasis on inputs is intended to help the output of roughages. Severin believes the Soviets also will work to reduce their protein shortage and remain independent of imports. Moscow intends to increase the protein supply through increased production of oilseed meals, through greater reliance on other, relatively high-protein crops (such as alfalfa and clover), and through further development of SCP.

Regarding the Soviets' ambitious plans, Severin concludes that:

Moscow will make enough progress on these initiatives to result at least in better balanced feed rations. . . . [L]arger supplies of feed per animal, together with greater proportional use of roughages . . . should result in an increase in meat per animal and milk per cow. This, in turn, should help hold down steadily rising meat production costs and put more meat on the table.

REFORM AND RESOURCE ALLOCATION IN SOVIET AGRICULTURE

By Kenneth R. Gray ¹

CONTENTS

	Page
1. Summary	9
2. 1986 Agricultural Performance and Intensive Technology	12
3. The System of Material Technical Supply in Agriculture	14
Imbalanced Supply	14
Excess Demand and Rationing	15
4. The Collective Contract—A Negative View	17
5. Farm Sales and Production Autonomy—Yet Another Negative View	19
6. Reorganization	21
7. Conclusion	22

1. SUMMARY

Changes in the administration of Soviet agriculture have an importance that transcends interest in the performance of agriculture alone. Significant economic reforms in China and Hungary were led by changes in the agrarian sector, and it is reasonable to think that the same might be true in the USSR. This is particularly so since Mikhail Gorbachev's first interest has been agriculture. He served, starting in 1978, as the supervisor of the Central Committee's national policy for agriculture. Even were his own inclinations at first mired in collective decision-making, one would think that his decisions for agriculture, after Brezhnev's death in 1982 and especially after becoming himself party general secretary in March of 1985, would mirror his own best ideas about what to do in the general sphere of the economy.

Changes in administrative organization and policy affected since 1982 and especially in 1985 were in fact followed by very good agricultural performance in 1986, the first year in six in which the current grain crop was announced. The Soviet measure of gross agricultural output grew by 5.1 percent over 1985, itself a good year, versus average annual growth of 1.2 percent in the preceding 11th five-year plan. It was a record year for livestock production, and

¹ The author who is Chief, Centrally Planned Economies Branch, Agriculture and Trade Analysis Division, Economic Research Service, USDA wishes to acknowledge the assistance of colleagues Edward Cook, Robert Koopman, and Yuri Markish in the preparation of the paper. Lisa Spears-McNeil provided excellent typing.

the year's grain harvest was the fourth best ever, 30 million tons greater than the average for the period 1981-85.²

The Soviet claim that the 1986 grain crop was due to policy is lent credence by the fact that 1986 weather was judged unexceptional by those who followed it throughout the year.³ But exactly what administrative changes caused such rapid improvement and whether such improvement in performance could continue are other questions. It is worth noting that improved performance can be due either to systemic economic reform or a "lower" category of policy and organizational changes. Here the "car and driver" analogy of comparative economics methodology is worth relating.⁴ In this metaphor, "road performance" (economic performance) can be improved by a better "driver" (economic policy), or—for a more lasting result—by trading the current rattletrap (economic system) for a new automotive model (systemic reform). While Gorbachev after 1978 was surely in the vehicle of agricultural administration he was not driving alone. As time goes on it is increasingly apparent that Brezhnev and others were asleep at the wheel.

The Brezhnev years (1964-82) increased food consumption, but by less (over time, increasingly less) than warranted by growing ruble investment and import dollars. A variety of different approaches, from western measures of total factor productivity to Soviet measures of rising cost and state subsidy, tell the same story of inefficient resource allocation.⁵ With slowed economic growth, declining foreign exchange earnings, and competing needs from other sectors, the priority given to agriculture under Brezhnev came under increased scrutiny in the eleventh five year plan period. Pressure grew for significant change: in personnel, organizational, and even reform of the system.

In fact, the speeches of the new party general secretary have rung with the sound of genuine reform. In early 1986, listeners were excited by Gorbachev's Party Congress description of changes in the state farm procurement system, in which he used the term "prodnalog", which stems from the New Economic Policy.

Reference to Lenin's NEP is frequently used to legitimize the market socialist ideas of the most reform-minded Soviet economists. Secondly, Western observers continue to speculate about development of the "contract brigade" which brings to mind both

² Given apparent machinations with the 1985 national income figures, some caveats seem prudent. However, in the thinking of this paper an improvement of some size in the harvest, not explained by the weather, is thought valid. Aside from USDA, a number of international organizations also judged the Soviet weather below normal. The 210.1 figure for the total grain harvest was given November 6 on the eve of the October Revolution celebration by E. Ligachev, and was published in the Plan Fulfillment Report (national press, Jan. 19, 1987). This is Soviet bunker weight, and although harvest weather was generally good—which would lower dockage rates—there were also press reports of apparently unusual acceptance by the state of unclean and moist grains.

³ The USDA estimate of the Soviet grain crop was 175 mt in August and September. USDA's estimate was raised to 180 in October, 195 in November and 210 in December, based upon press reports, especially procurement reports, and new perspectives available from the 1981-85 data release.

⁴ This analogy is due to a forthcoming textbook by Professor Stephen Garner of Baylor University.

⁵ Good sources for western comparison of this inefficiency are the chapters by Folke Dovring and by Vernon Ruttan and Lung-Fai Wong, in K.R. Gray (ed) *Contemporary Soviet Agriculture in Comparative Perspective*, forthcoming from Iowa State University Press. These chapters were papers presented at a conference at the Kennan Institute for Advanced Russian Studies in April 1986.

Ivan Khudenko's revolutionary 1960s autonomous link and the Chinese responsibility system which has been successful in expanding Chinese agricultural production.⁶

However, in early 1987 most Sovietologists are probably hesitant to say what model car Gorbachev might be driving when the economy is reviewed in the next volume of this triennial. Despite talk of "radical reform" we await proof that new initiatives for personal initiative, money-commodity relations, self-finance, and reduced numbers of plan indicators, are not basically similar to initiatives—which all failed in the past.

Skeptical Russians discussing the current reform talk are inclined to say that, "it sounds like 1965."

Abel Aganbegyan criticizes the "five ministries" decentralization experiment begun in 1983 as a repetition of the Kosygin reforms of the 1960s, doomed to fail without resolution of the twin problems of the inputs supply system and inputs pricing.⁷ These perennial stumbling blocks to the reform of planned socialist economies very much impede hopes for efficient agriculture and are the focus of this article.

However, "radical talk" imparts a message of will. And statements such as those which come regularly from Academician Aganbegyan, a Gorbachev adviser: that significant reform will occur in the next (13th) five-year plan only after much spadework in this one, impart a sense of realism.⁸ Attacks upon mid level bureaucrats who derive power from rationing scarcity are needed politically if the material-technical supply system is to change.⁹ All taken together suggest the possibility of success.

Also, anticipation of real economic reform expands as do Gorbachev's policies of "glasnost," liberalization in the cultural sphere, and calls for party reforms. But, this kind of thing, too, has come—and gone—in cycles. As the Russians put it, "It sounds like Khrushchev." (And one would be more inclined to think these things permanent if announcements of the release of dissidents were not made by the Ministry of Foreign Relations.)

Other papers in this volume look in greater detail at the specific major pieces of agriculture legislation: the 1982 Food Program, the 1983 farm price increases, the provisions for farm labor organization and remuneration, and the March 1986 decree on agricultural management, pricing, etc.

This essay starts out by looking at the immediate result at hand at the writing of this paper, the 1986 grain harvest, and seeks to explain it. We then proceed to see how the systems of material-technical supply, input pricing and output and marketing pricing effect hopes for the contract brigade and farm autonomy in production and marketing. Agricultural reorganization is related to hopes for the improved supply of intermediate inputs.

⁶ Alexander Yanov, *The Drama of the Soviet 1960s: A Lost Reform* (Berkeley, CA: Institute of International Studies, Research Series No. 56, 1984).

⁷ E.g. interview with A.G. Aganbegyan by Boris Kononov, *Nedelya*, No. 1, 8 Jan. 1987. Trans. *FBIS Daily Report*, 22 Jan. 1987, p. S11.

⁸ A. Aganbegyan, interview with Denis Legras, *Le Figaro*, March 10, 1987, p. 3; trans. *FBIS Daily Report*, March 16, 1987, p. S1.

⁹ E.g., T. Saslavskaya, interview in *Nepszabadsag*, 24 Jan. 1987, p. 5. Trans. *FBIS Daily Report*, 6 Feb. 1987, p. S2.

The 1986 crop and other successes seem to be the result of the taking up of slack by better technique and directive. Reorganization may facilitate better investment and coordination of farm production and subsequent processing. However, there is not yet reason to think that significant economic reform is imminent. Farm autonomy and efficiency are hamstrung in the foreseeable future by the pricing system and problems of farm income formation.

2. 1986 AGRICULTURE PERFORMANCE AND INTENSIVE TECHNOLOGY

The 1986 grain harvest of 210.1 mt broke away from the "plateau" of 1981-85 harvests which exhibited less variation but averaged 25 mt less than the previous 1976-80 period.

The poor performance of Soviet grain production during 1981-85 increased reliance upon imports of grain, which averaged 40 mt annually. In 1984/85 record imports of 55.5 mt included over 28 mt of wheat, an amount equal to three-fourths of the wheat (35 mt) the Russians are thought to use annually for food consumption!¹⁰

The 1986 wheat harvest (92.3 mt) was welcomed for both its size and quality. Approximately a third (30 mt) of the 1986 wheat crop was judged to meet the "strong, hard, or valuable" standards. The procurement of hard wheat was 50 percent higher than in 1985 and procurement of durum wheat used for pasta doubled. This resulted from improved procurement terms for quality wheat and some "modification" of the way wheat was graded as well as from a program called "intensive technology."¹¹

"Intensification" is currently one of the "buzzwords" of the Soviet economic policy discussion. In agriculture, "intensiveness" has a fairly concrete meaning. Its opposite, best illustrated by extensive grain production through expanded area, characterized the growth of Soviet farm output especially during development of the New Lands in the 1950s. Pressure to plant maximum area has long been a part of what local party organs do in their exhortative management of farming.¹² In brief, "intensive" means greater yields. In Russian discussions "intensive technology" is short for the entire assortment of farming techniques which lead to higher yields. This includes crop rotations and fallow which make it possible to control weeds and diseases, and maintain soil fertility and moisture. Increasing yields also requires the matching of seed varieties, the program of fertilization, and natural conditions. Correct, timely, and careful farm operations are also required. In small grains, Soviet intensive technology may borrow the West European

¹⁰ Much domestically produced wheat is, however, fed to animals; even in the worst harvest years, total wheat production is practically twice the quantity consumed by humans. However, much of this wheat is of low quality, or it is logistically poorly located.

¹¹ Prices for quality wheat were raised for the 1985 and 1986 crops and a provision was made that quantity premiums would be paid for durum, even were plan not met for overall grain sales. Discolored grain from the 1986 harvest was accepted, if it met gluten and lowered test weight standards.

¹² Western economists' production theory postulates that it may generally be possible to produce more by varying proportions and actually using less of an extensive factor. The Russians seem to have arrived empirically at the observation that it is counterproductive to farm much land if it is farmed badly. Or, maintain too many underfed cows if the feed they consume goes mostly to maintenance and not to production. With an intentional policy of culling, the number of cows (particularly in relation to growing cattle inventories) has dropped since 1982. Milk yields and total production have meanwhile both increased.

use of a "technical track," a wheel base track which is not planted, but driven in. This allows many tractor passes to apply fertilizer side dressing and pesticide without excessively compacting soil.

In fact 1986 did have the second highest total grain yield ever (1.8 tons/hectares) on the smallest harvested area (an estimated 116.5 m.ha.) since the late 1950s. Grain area reduction, to a level 10 percent less than that of 1977, was a deliberate policy meant to increase the area of sown feed crops and fallow.¹³

A total of about 17 m.ha. of wheat was included in the program called intensive technology in 1985.¹⁴ The total harvested 1986 wheat area, an estimated 48.7 m.ha., was the lowest wheat area in recent history, but the yields (an estimated 1.79 tons per ha.) were by far the largest of any year, excepting 1978 which had uniformly excellent weather. About half the wheat area in 1986 was under the intensification program.

Soviet claims were that intensive technology contributed an additional 16 mt to total grain production in 1985 and 24 mt. in 1986. However, the methodology of calculating this gain seems to be based on comparing yields of fields designated as being in the program, with fields which are not.¹⁵ The problem is that "intensive technology" is a centrally promoted program. Typically in the past such programs have become campaigns which subordinates wanted to appear successful, and they gave them priority. The evidence is that the better fields within farms and the better farms within regions were designated as intensive technology areas.¹⁶ To the extent this is true, the Soviet calculation of gain from intensive technology overstates both achievement and the promise of future increases when the program (or the name at least) is extended to poorer land.

There is another reservation among western analysts. The Russians describe intensive technology as field crop activity that is not only well executed, but well supplied with off-farm inputs. Isn't this then "robbery of (non intensive-technology) Peter to pay (intensive technology) Paul?

The answer is, "not necessarily," because the system of material technical supply has certainly been inefficient in agriculture, both in locating and concentrating off-farm inputs efficiently. The uncertainty of supply attached to the system has no doubt demoralized farm labor and management. The program of "intensive technology" may well have improved the allocation of off-farm inputs.

¹³ Thus, how the grain crop was achieved contributed directly to feed crops and livestock production, which were record in 1986.

¹⁴ The 1985 grain harvest of 191.7 mt was 11 mt greater than the 1981-85 average of 180.3 mt. Of this total, 10.5 m.ha. was spring wheat and 6.4 m.ha., winter wheat. In 1986 the area of winter wheat in the program was increased from 6.4 m.ha. to 15.1 m.ha., while the area of spring wheat in the program remained about the same. The total amount of grain in the intensive technology program for 1986 is variously given as 29 or 31 m.ha. 31 was apparently planned and 29 harvested. This includes 3.9 m.ha. of corn which was apparently transferred from an earlier row crop designation called "industrial technology". *Ekonomika sel'skogo khoziastvo*, No. 1, 1987 and scattered newspaper reports.

¹⁵ This is described in the yearly, *USSR Situation and Outlook Report*, May 1987. (Washington: USDA/ERS). Edward Cook is due credit for gathering the evidence that the Russians are calculating the gain from intensive technology as described in the text.

¹⁶ *Econ gazeta*, #52, 1986, p. 10.

3. THE SYSTEM OF MATERIAL TECHNICAL SUPPLY IN AGRICULTURE

IMBALANCED SUPPLY

One of the true mysteries facing observers of Soviet agriculture is why the grain yields of 1981-85 were so poor. Only in 1985 did yields rise above the average of 1976-80 (and then only by 1 percent) despite an increase in inputs. Overall, grain combines increased in number 19 percent for 1985 compared to 1976-1980, tractor numbers by 30 percent and fertilizer applied to grain by a remarkable 46 percent.¹⁷ While weather is, of course, a factor in year-to-year fluctuations, it is a factor which should tend to wash out over five-year periods.

In their study of Soviet (as well as other socialist) productivity performance, Wong and Ruttan show that Soviet labor and land productivity increased over the (longer) period of their investigation, but greatly at the expense of capital and fertilizer productivity. They conclude that the potential gains from technical change in the agricultural sector may have been "wiped out by losses from the misallocation of resources."¹⁸

The Soviet Union has not gotten the kind of grain yield response from fertilizer that planners expected or that is suggested by world experience where long-term yields are strongly correlated with fertilizer application rates. It may be useful to think of low yields as the result of a lack of or misallocation of inputs and activities complementary to high fertilizer usage. These have kept Soviet yields from following the trend that fertilizer usage should have produced.

Intensive technology, then, can be thought of as the activities and the provision of inputs to support activities which make fertilizer work; to the extent that "intensive technology" is a successful policy overall it must also be a relocation and concentration of inputs in a more sufficient pattern.

Cropping patterns and tilling which principally utilize farm's own resources to kill weeds and in other ways preserve moisture may be the single most critical complement to high fertilization rates. So is the proper application of balanced fertilizer, good seed, liming and the availability of pesticides to protect higher yields, the availability and use of specialized implements for working dry land fallow, minimum tillage, light weight tractors which do not cause soil compaction, and so forth.

In fact, most of the things on the above list are scarce. First, it should be noted that the growth of fertilizer itself has been unbalanced. Of the principle components, nitrogen, phosphate and potassium, the production of nitrogen fertilizer has been much more rapid. According to Soviet norms, the NPK in the fertilizer that is applied should be in the ratios (1.0:1.1:1.0) yet that in 1985 the ratio was (1.0:0.65:0.60).¹⁹

A general shortage of modern pesticides (including herbicides, insecticides, fungicides, and other chemicals) exists and there is a

¹⁷ *Narodnoe Khoziaistvo SSSR* for various years.

¹⁸ Wong and Ruttan, *op. cit.*

¹⁹ *Sel'skaya zhizn*, Oct. 16, 1986.

limited assortment. In the early 1980s only 53 of the 144 preparations felt needed were produced.²⁰

Yet other bottlenecks are equipment for applying both fertilizers and pesticides, and systems for handling and storing both. The importance of this is emphasized by the description in a Soviet agronomy journal of the application of pesticides on intensive technology grain fields using broken but still mobile grain combines to carry tanks and bombs. That even the highest priority fields would find this necessary is indicative of the need.

The twelfth five year plan seems intent on breaking some of these bottlenecks by production, and also by imports. One aspect of the intensive technology program is the increased imports of both phosphate fertilizer and pesticides. Data for 1985 (the last available) show that phosphate imports rose in 1985 to over 700, from less than 100 th. tons in 1984. The imports of pesticides rose by 68 percent between 1981 and 1985, to 152.1 th. tons.²¹ Every indication is that imports in 1986 rose as well. Also in 1985, the amount of the more modern and potent pesticides which are imported from western countries, as opposed to Comecon countries, increased by 70 percent compared to 1984. Their ruble value increased by 122 percent.²²

EXCESS DEMAND AND RATIONING

In any country some things are always relatively more scarce than others. However, the system operative in Soviet agriculture has not solved the resultant allocation problem very well. Although Soviet farms have for some time calculated costs of production and profits, they have not sought to minimize costs by selecting inputs the way that western farmers do. One reason is that a very large number of off-farm inputs are supplied under conditions of shortage. This means their provision is uncertain. If for "lack of a nail" all of production happens to fail, resultant average costs are tremendously high. Thus, costing, substitution, and choice considerations succumb to input attainment satisficing.

The excess demand for farm inputs is due to several factors. One of these is that input prices based upon cost of production simply cannot balance supply and demand in the short run. Additionally, the prices of many inputs are subsidized at a price below the state industrial cost of production (fertilizer and machinery subsidies are approximately 5 billion rubles annually). Thirdly, the pressures for fulfillment of gross output plans causes profitability and cost considerations to be secondary for farms (Kornai's soft budget constraint).

Given that prices do not ration requests for agricultural inputs, the authorities that ration inputs have to do so with only limited information and theory about the productivity of scarce inputs in various possible uses. Allocators have had to resort to other criteria. Some of these are political. Others stem from the Russian

²⁰ *Voprosy ekonomiki*, No. 6, 1981, p. 12.

²¹ *Vneshnaya trgovlya v 1985*.

²² This information is due to Yuri Markish who has calculated from *Vneshnaya trgovlya v 1985* that pesticide imports increased by 70 percent from developed countries in 1985 over 1984, but only 6 percent from COMECON countries which produced lower value products of less complicated chemistry.

policy of "leveling" (vyravnit') yields or physical output.²³ (An alternative is financial equalization). In Russian circumstances, the attempt to "level" has meant irrationally putting fertilizer (for instance) on poor soils to bring up their yields to levels achieved elsewhere.

There are two aspects of off-farm input misallocation which are important for Soviet agriculture. The first involves the location (regional and intraregional) of resources. The second involves the concentration of complementary resources. There have been problems in both of the areas. The program of intensive technology seems to have improved the location and the concentration of inputs and increased efficiency.

There is reason to believe that resources have been allocated inefficiently among regions, particularly in a north-south dimension. During the 1980s, the heavy investment in the north of Russia (particularly in the non-black earth zone) came in for criticism, albeit muted criticism because of the attachment to the program by leaders. It was, though, apparent that the returns to this program were very low compared to returns in the southern parts of the USSR.²⁴

Among the reasons advanced for heavy investment in the northern non-black earth zone was the necessity to bring up the level of agriculture and living in this zone of poorer soils and short growing season. The same reason has been given for directing compensatory resources to farms in poorer circumstances within smaller regions.

Intensive technology itself seems to reflect an emphasis on the provision of the south with available off-farm inputs. The area of intensive technology in winter wheat, a southern crop, increased by 10 m.ha. between 1985 and 1986. The grain yields of the good southern soils of the North-Caucasus were record. If these areas had been unwarrantedly neglected and could make the most productive use of inputs, then their emphasis is an improvement in resource allocation. Whether this is a triumph of agronomy and economics over politics, or just a triumph of the new agricultural leadership (which includes a large number of persons from the south) is not certain, however.²⁵

A second aspect of the allocation of off-farm inputs is their concentration. Here the point is illustrated by the analogy of a chain. Scattered links have no effect. A chain, complete except for a few missing links has no effect. A complete chain is no stronger than its weakest link. In a like manner, when "inputs links" are in scarce supply, "scattering them around" is a mistake. The presence of really scarce factors would dictate that other inputs would be concentrated around them. Thus, if pesticides are the really limiting factor and are needed in minimum dosages, they should be

²³ See, K.R. Gray "Soviet Agricultural Prices, Rent and Land Cadastres", *Journal of Comparative Economics*, No. 5, 1981, p. 55.

²⁴ Petr Klemyshev, "Effektivnost' ispol'zavaniia proizvodstvennykh resursov sel'skogo khoziaistva", *Voprosy ekonomika*, No. 3, 1982, shows interregional differences in "effectiveness". D. Gale Johnson and Karen McConnell Brooks found that overall (total) factor productivity grew by 2 percent annually in the Soviet south while falling 1.6 percent in the north, *Prospects for Soviet Agriculture* (Bloomington: Indiana University Press, 1983), p. 147.

²⁵ Another caveat is that the investment in winter wheat may have paid off in 1986 but may not pay off as well on average over time. Such a point may be proved in winter 1986/87 by above-average winterkill.

used on the best land and be complemented also by the best fertilizer, etc.

The concentration of resources by taking them away from uses where they are not complemented will not lower production much in the latter uses—but it can considerably increase production in areas where all the necessary complements are present. So, "Paul" gains more than "Peter" loses.

A scattering of resources tends to result from an egalitarian attempt to bring everybody's production up because that is "fair". Ten years ago in travels through rural Russia this author was told by officials of an administrative region that they would send fertilizer to a poor farm to "help it out". This differed from the more production-minded ethic heard in 1986. A USDA team observing Soviet agrochemical installations was told that RAPO management gave the designation "intensive technology" to the best farms having the best land and also the most qualified management and able, disciplined work force. Everything else had to be in place before the material inputs from the outside were granted.

One measure of the concentration of off-farm materials on the selected intensive technology fields is the account that fields under intensive technology accounting for 13 percent of grain area in 1985 received 19 percent of fertilizer then used on grain. In 1986 the area of grain in this category roughly doubled (to 27 percent) but the area's share in all fertilizer used on grain increased two and a half times (to 56 percent).²⁶

4. THE COLLECTIVE CONTRACT—A NEGATIVE VIEW

The movement to put farm labor crews on a different pay status (the *podriadnyi* or collective contract), tied somehow to the "final product" of their work corresponds to a similar thrust throughout the economy. It got its impetus in 1983 and again in the March 28, 1986 decree on agriculture which said that all agricultural land should be tied into collective contracts by 1988. The progress of the implementation of the collective contract in agriculture has been unclear. Those who have studied it have not noticed great breaks with the past methods of remuneration, except in name.²⁷

It is fairly clear that the collective contract which has been sanctioned and sought to be universalized by the nation's leadership is not the same as the link associated with Khudenko and the 1960s, which was really autonomous. That is, workers had no norms. In that arrangement, farm workers were also allowed to restrict their numbers and motivated to organize their work and increase production by being able to keep a large part of the increase for themselves. Allowed to "get rich" they proved they could produce.

Don Van Atta, who has done an exhaustive study both of the history and the current writings on farm labor organization has found that the present primary prototypes for the current collective bri-

²⁶ Calculated by Edward C. Cook from data given in *Khimiya v sel'skom khoziaistve*, July 1986. These data imply a concentration apart from that resulting from heavily fertilized corn's inclusion in the intensive category in 1986.

²⁷ Karl-Eugen Waedekin, "'Contract' and 'Normless' Labor on Soviet Farms: An Interpretation and Prognosis". *Radio Liberty Report* 49/84, Feb. 8, 1984.

gade, are in fact quite "normed" and non-autonomous.²⁸ Given the success of autonomous labor organizations it is not clear why this continues. To the factors Yanov cites (including jealousy and income inequality) might be added the observation that the status of material-technical supply is a fundamental barrier. Labor in a complex setting cannot really be independent and productive without materials to work with.

This is tied up neatly in a poster from the 1970's Soviet quality campaign. The poster carried two messages. In a watch repair shop, a worker is depicted approaching with a meat cleaver a delicate watch which is sitting on a butcher's chopping block. In the background is a work bench littered with splintered watch parts. On the wall is hung an assortment of braces, wood planes, tongs, and tools—in general unfitted for the job. While the artist makes the worker look slovenly, he also manages to identify the major culprit: what the repairman has to work with, and the system of material technical supply that supplies it.

Karl-Eugen Waedekin has found evidence that farm workers themselves often don't want to have their remuneration depend heavily upon "final harvest results", but would rather be paid according to their separate activities (plowing, sowing, etc.). This is because of the risk of remuneration when the final result depends upon both the weather and the undependable supply system.²⁹ Thus, for example, being rewarded for a good harvest when the harvest is assured by timely delivery of fertilizer is one thing. It is another if the fertilizer is delivered late: the workers would then rather be rewarded for the area they have plowed, than what the area produces. (Khudenko's and similar links were in fact favored by complete priority provision of inputs.)

The failings of planned supply systems are less important in China, which has much less need for off-farm inputs for agriculture.³⁰

Soviet statements don't, in fact, stress labor organization as a principal reason explaining the 1986 harvest. However, in light of the above, it stands to reason that where supply priority is guaranteed there is a synergetic effect with labor which responds to "end-result" oriented rewards.

That the type of labor contract being developed is not really autonomous and self-initiating is also implied by the imperatives of intensive technology. There is an apparently a tremendous educational endeavor underway to educate farm workers about this technology. This aspect sounds not at all like either Khudenko's experience or the Chinese experience, neither of which was accompanied by such a centrally orchestrated educational campaign.

²⁸ Don Van Atta, Towards a Soviet "Responsibility System?: Recent Developments in the Agricultural Collective Contract", forthcoming in K.R. Gray, (ed.) *Contemporary*, op. cit. Van Atta Attributes initial success of campaigns to the special attention workers give to their work because of the spotlight they are in.

²⁹ Waedekin, op. cit.

³⁰ Waedekin, op. cit.

5. FARM SALES AND PRODUCTION AUTONOMY—YET ANOTHER NEGATIVE VIEW

Changes in the rules for farm sales have had as yet uncertain effect; they may reduce the state food subsidy and lend themselves to provide better quality produce. But they do not offer increased freedom of farm choice in what to sell.

When the idea of "prodna-log", referring to the 1920s marketing system for agriculture, was first mentioned by Mikhail Gorbachev it created quite a stir in the West. This is not because many particularly knew the details of NEP market and tax arrangements. It was because "NEP" itself meant market socialism in which the state did not impose physical plans on farms.³¹

Officially, farm managers are supposed to have autonomy in making decisions about production (varieties, area, timing, etc.) and be subject only to a procurement plan. But in fact tight and detailed sales plans put production decisions in a straight jacket. In fact, farms, guided by prices so that societal needs are taken into account, are best placed to determine their own comparative advantage. The state itself, as long as it is assured the proper totals and overall assortment of farm sales, has no legitimate interest in which individual farms produce exactly what products. The formation of procurement quotas is from this point of view a nuisance for state and enterprise.

In fact, a proposal for "Free Sales" of agricultural products, had been made in the early 1960s and it was debated until 1967. Under this proposal farms would not have had specific marketing quotas, but would have been able themselves to choose what they would sell. Farm ability to truly choose what to produce could unleash a great variety of efficient adjustments. But Free Sales was rejected in large part because existing procurement prices could not guarantee minimally necessary deliveries of each product. Existing prices were simply too far from equilibrium.

During the 1960s discussion of Free Sales, a valuable suggestion was made by Dmitri Koroviakovski. He proposed that the state not go off procurement planning "cold turkey," but rather seek a gradual transition.³² In this plan the state would set a minimal plan for products, violation of which would incur sanctions, but production above these amounts would be guided by flexible market prices. As the economy grew, a larger and larger part of sales would become market-guided. The advantage of this plan was that it would allow the state and other marketing agents time to learn how to adjust prices to get the intended result.

Something somewhat similar to Koroviakovski's proposal seemed possible as a result of the March 1986 decree. According to this, an amount of fruits and vegetables equal to thirty percent of procurement plan could be sold, not to the state at fixed state prices but through a variety of other (private and cooperative) channels at more flexible prices. During the summer of 1986 a large influx of vegetables into Moscow apparently occurred, sold in cooperative

³¹ V.I. Lenin, *The Tax in Kind* (Moscow: Progress, 1967). M. Gorbachev, *CPSU Central Committee Political Report*, 25 Feb. 1986, *FBIS Daily Report*, 26 Feb. 1986, p. 014.

³² D.Z. Koroviakovski, *Zagotovki sel'skokhoziaistvennykh produktov i ekonomika kolkhozov* (Moscow: Kolos, 1968), pp. 89-90.

outlets at prices above those of state stores but less than those of the collective farm markets. These vegetables were reportedly of high quality.

For grains and livestock products, the two (or three) tiered pricing system in existence for some time was maintained. That is, higher prices are paid for above-plan and above-11th five year plan achieved levels. In addition the grain purchase plans for the 12th plan period are supposed to be fixed, providing incentive for increased sales.

Some purchase prices were made flexible at the oblast level. The RAPOs and Kombinaty (see the next section of this paper) also have the right to vary retail food prices locally for special products.

Some cynical observations can be made about changes in the marketing system. One is that farms already supposedly had the authority to sell above-plan produce through cooperative and collective farm market outlets. Since the late 1970s they also have had the authority to sell 10 percent of the fruits and vegetable plan to non-state outlets. Also, although Moscow may have been blessed with fresh fruits and vegetables, it must have been singled out by the state for help with transportation and so forth, because other cities have not reported the same success. Some published complaints note that very few farms have been taking advantage of the "new" provision. Others noted that the produce seems to have disappeared from the stores and reappeared in more expensive cooperative outlets.³³

There is a clear pragmatic advantage to the state in increasing the share of farm sales which are marketed through unsubsidized cooperative channels since this reduces the expense to the budget. Allowing sales at higher prices is also being associated with real increases in quality. Kal'nysh has pointed out that people are ready to pay for higher quality which, although it costs more, commands prices which make higher quality products more profitable than poorer quality ones.³⁴

Larger mark-ups to farm gate prices probably efficiently and belatedly recognize the insufficient attention that has been paid to processing and the other stages downstream from farm production.

However, the intent of the most recent marketing rules seems not to free up decisions about what is produced, but through prices to reemphasize the state's own determination of what each farm is to produce. The even larger premiums paid for sales of specific products above-plan, and the provision that farms can market through alternative channels, 30 percent of plan, all emphasize, not deemphasize plan. These provisions are accompanied by bold statements that the state will "scientifically" determine efficient marketing plans, which sound empty to anyone who is acquainted with this problem.³⁵

Also, relatively sophisticated academies of sciences economists meeting at Tufts University in June 1986 denied that the new emphasis on marketing more fruit and vegetables at higher prices

³³ *Izvestiya*, March 11, p. 1.

³⁴ A.A. Kal'nysh, "Problemy regulirovaniya sootnoshenii zakupochnykh optovykh i poznichnykh tsen na produkty pitaniia", *Vestnik sel'skokhoziaistvennoi nauki*, No. 11, 1986, p. 10.

³⁵ See, for instance, K.R. Gray, "Soviet agricultural prices, rent and land cadastres", *Journal of Comparative Economics*, No. 5, 1981, pp. 43-59.

through cooperative channels was related to Koroviakovsky's idea of phasing out the role of the procurement plan. They believed that plan targets would be increased at the end of this five-year plan. Indeed, there has already been doubt expressed after only one year that grain sales plans established for the five-year plan will be left unchanged for the whole period.³⁶ This, too, sounds like an old refrain from the Brezhnev period.

All this indicates that a spirit for decentralization of agriculture such as existed twenty years ago does not exist now. On the other hand, some things could be noted which could someday lead to more farm choice in what is marketed. The free sales advocate and publicist, Genardy Lisichkin, has had his articles from the 1960s republished in a recent book. Koroviakovsky himself has been publishing prominently.³⁷ As things unfold, experience with contract prices and cooperative channels could be gained which could allow the role of physical plans to be reduced eventually.

There is much talk about *khozraschet* and self-finance, which is also not convincing evidence of emerging farm autonomy. Articles in newspapers do criticize bull-headed administrative interference. For instance in an *Izvestiya* series (called "Independence and Responsibility") started in late 1986, one farm director insists on ignoring the RAPO's sowing plan, and instead concentrates production on less area. He "risks his head" doing this but he eventually proves intensive technology correct by exceeding the procurement plan. But he has a heart attack in the process, as does another farm director struggling with his own RAPO which is overzealous in its promotion of intensive technology, to the point of violating proper agronomic norms and disregarding farm resources.³⁸

There are various ways to read this. If it were not for Moscow's ongoing campaign for "intensive technology," we could say that *Izvestiya* is defending heroic farm managers against oppression. But a truer interpretation is that Gosagroprom (through *Izvestiya*) is using the image of the conscientious farm manager to coerce local authorities (RAPO's) into proscribing the campaign, but also passing on responsibility for success or failure by insisting that RAPOs promote intensive technology, but do so "carefully."

6. REORGANIZATION

Rayon Agroindustrial Associations (RAPOs) were approved in the 1982 Food Program to be implemented everywhere as a means of increasing the coordination of various parts of the food complex which were located in different ministries. Thus, problems with repairs and agrochemical services provided farms and problems with the processing and transportation of farm products were supposed to be solved by a local association. It was clear from the beginning that the RAPOs held no magic solution. One of their problems of coordination lay in the fact that local enterprises were subject to the "dual subordination" of both their own ministries and the RAPOs.

³⁶ V. Kulagin, "Ne slishkom li trudny pobedy", *Izvestiya*, Feb. 4, 1987.

³⁷ G. Lisichkin, *Ternisty put' k izobiliiu* (Moscow: 1984); Koroviakovsky, "Kolkhoznyi rynek i snabzhenie naseleniia prodovol'stvem", *Voprosy Ekonomiki*, 9, 1986.

³⁸ Kulagin, op. cit.

And this was one of the justifications for announcement of the formation at the national level of a State Committee on Agriculture (Gosagroprom) in November of 1985. Combining agricultural services, farming and the food and meat and dairy processing industries was also the occasion for a great replacement of personnel in the agricultural administration of the nation.

Economists are generally cynical about the enduring change that can be affected by organizational changes, and indeed, Soviet history provides an ample number of examples of enthusiastic changes which are eventually reversed. (Bulgaria offered just such "change back" when its own version of Gosagroprom was "disintegrated" in 1985 only months before Gosagroprom was born!)³⁹

However, as technological interrelationships in production change, a certain amount of organizational change probably has to occur to even approximate efficiency. Grouping naturally related activities within a single organization can facilitate more timely and efficient transactions. This happens in western market economies. It is even more important in Soviet-type societies where transactions among enterprises are very difficult because of faulty prices.

The RAPOs do have some flexibility in determining transfer prices. USDA officials in the 1986 agrochemicals delegation did get the idea that some of the previous questions of pricing agrochemical services had been ironed out after the formation of Gosagroprom.

In his 27th party congress speech, Gorbachev made major points that, "as much as 20 percent more raw materials" could be made available for final food products through better processing, and that preserving more of what farms produce could cost one third to one-half as much as producing more at the farm level.⁴⁰ Vertical integration in the food complex can lead to more rational investment between farming and the branches downstream from farming. Elements of Gosagroprom, once in charge of farm production but now in charge of reaching consumers with a "final product," may decide to emphasize investment in those parts of the food chain which have the highest payoff.⁴¹

In addition to the RAPOs (which followed the integrated MKhO and MKhP of the seventies) there is now a new vertically integrated organization called the "Kombinat." One of the first of these is the "Kuban Kombinat," in Krasnodar Krai. This organization is intended to focus the new increased investment in food processing for the creation of more and more varied processed food products during the 12th five-year plan.

7. CONCLUSION

An element of the promise of private and cooperative activity in light manufacturing and distribution including public catering is

³⁹ See the paper by Michael Wyzan in Gray (1987) for the fate of Bulgaria's integrated ministry and Paul Gregory and Robert Stuart's popular textbook on the *Soviet Economy: Structure and Performance* for a standard view of organizational change in the USSR economy.

⁴⁰ V. Sergeev, "Puti intensifikatsii molochnoi otrasli", *Planovoe khoziastvo*, 9, 1986, p. 107.

⁴¹ When in summer 1987 I asked an official of the Leningrad Gosagroprom, whether an extra 1,000 rubles should be spent on vegetable production or storage, he said that although he had all his life been associated with farm production, he would have to say, storage.

that while these activities are relatively labor and imagination intensive they make relatively few requirements on the supply system. However, improvement of conditions for material-technical supply has to be on the minds of Soviet leaders because it is so fundamental to improvement of the entire economic system.

Material-technical supply is a key to success—particularly in complex operations where timing and location are important. Efficient provision of complementary inputs can cause labor to have a sustained interest in final results: inefficient provision can demoralize labor. Intensive technology in agriculture and elsewhere depends upon improved supply. Gosagroprom chairman Murakhovsky stresses that the wholesale (non-allocated) provision of capital and material investment totaling 600 million rubles for 56 enterprises is part of what is expected to make the new food kombinat "Kuban" work.⁴²

Technological change (new products and processes), already risky, is made even more risky by erratic input supply. In the Soviet system it does seem to take supply priority like the Kuban Kombinat has (like venture capital in capitalism!) to demonstrate that new production relations can exist.

Such projects can also establish the production norms which are meant for use in subsequently planned replicated experience. But it is just because material-technical supply in the Soviet system is so crucial to the success of projects, industries, etc. that we are wary of incubated success. The priority provision of materials (what the Russians call the "zelenaya ulitsa," green, or even "easy" street) is not the same thing as a sustaining process of efficient allocation.

A large problem for both efficient marketing of farm output and the efficient provision of materials and services is the burden farm income objectives place upon the pricing of these activities. The USSR does not have a land tax or income tax that is differentiated on the basis of land quality. This means that prices have to do "double duty" as extractors of rent and guides for decision-making. (Creating, however, perverse incentives, since low prices exist where costs are low, discouraging output, and vice versa.) The rents established by not taxing good land and rationing scarce inputs are a reason for not giving farm brigades full freedom to get rich.

Although there are signs of a reopening of the differential rent instrument discussion which ended in the mid 1960s, this fundamental problem is far from achieving consensus among intellectuals, let alone political resolution.⁴³

The imposition of tighter credit restrictions and requirements for self-financing accompanied the large 1983 price increases and are part of the March 1986 decree. These changes have apparently reduced the demand for some inputs. A farm manager reports, for instance, that in the next few years he will probably discontinue what had been routine purchase orders for certain machines, because the cost is now important and they are already redundant anyway.⁴⁴ In another case, farms refuse the acceptance of low-

⁴² *Pravda*, 13 October 1986, p. 2; trans. JPRS-UNE-86-103, p. 24-29.

⁴³ E.g., "Krugly stol: differentsiatsionnaya renta i effektivnost' sel'skokhoziaistvennogo proizvodstva," *Ekonomika sel'skogo khoziaistva*, No. 6, pp. 51-63 and No. 7, pp. 66-72.

⁴⁴ F. Chernetsky, "Vprezhnem stile," *Izvestiya*, 23 December 1986, p. 2.

quality combines.⁴⁵ These incidents reflect a very conscious attempt to harden the (Kornai) soft budget constraint, a major condition for the improved allocation of materials. A regime of wholesale trade also requires flexible and demand-oriented pricing. But most price changes so far, including those which accompanied the elimination of some subsidies for inputs in the 1983 don't reflect the fundamental change in pricing philosophy needed. Whether farm input pricing will follow the current tendency of retail food prices to reflect quality and demand is important to watch.

In North America, it is possible for "low input" farming to exist side-by-side with highly industrialized farming. Both types of farm may be equally profitable, despite much different yields, because the low-yield farm has lower costs.

The Soviet Union since Brezhnev has pursued a policy of rapid off-farm input expansion. However, despite the priority, not enough inputs could be provided to create high intensity agriculture everywhere. Yield attainment was stressed and inputs subsidized. Without a better allocation mechanism, with no encouragement anywhere to be an efficient low-input farm, many of these resources were unconnected and wasted.

V.V. Miloserdov, an agricultural cyberneticist (now attached to the Central Committee of the party) has shown how "equity" considerations enter into procurement and material allocation where planners are compelled to try to compensate for financial hardship. For instance, Miloserdov says that procurement planning is often guided by the principle of "vsem po nemnogu." If an output is either extremely profitably or unprofitably priced, a planner may put a little of it in the sales plan to each of a number of farms.⁴⁶ Out of the same duty to fairness, scarce inputs may be provided another farm, not because it can make the best societal use of them, but because the farm is financially stressed.

Tighter credit conditions and emphasis on profitability are necessary first steps toward a rational system for the allocation of off-farm inputs to agriculture. However, if the tax system and the pricing of both inputs and outputs are not improved simultaneously, tighter conditions for credit and emphasis on profitability can make life more difficult for the planner who is trying to allocate resources efficiently but is constrained by "equity."

Prioritizing is a strong feature of Soviet-type planning. It, and budgetary discipline, grew lax under Brezhnev. The Gorbachev regime seems to have said "no" to projects, from Siberian river diversion to a range of other unfinished projects with well-established clienteles, while at the same time saying "yes" to other projects which a few years ago had only fledgling support. The marginal benefit of some of these (in food processing and certain bottleneck inputs industries, etc.) may be quite large.

⁴⁵ Moscow Domestic Service, 1800 GMT, 13 Sept. 1986; trans. *FBIS Daily Report*, 15 Sept. 1986, p. T1.

⁴⁶ V.V. Miloserdov, *Optimal'noe razmeshchenie gosudarstvennykh zugotovok* (Moscow, 1971), p. 100.

Finally, while making more decisive decisions is not reform, it can take up "slack" and improve operation of the system. And it just may be that, in order to achieve the leadership legitimacy needed to "purchase a new car" (i.e., true economic reform), Mikhail Gorbachev must first prove his ability to manipulate the old.

GORBACHEV'S AGRICULTURAL POLICY: BUILDING ON THE BREZHNEV FOOD PROGRAM

By Penelope Doolittle and Margaret Hughes*

CONTENTS

	Page
Summary	26
Background	27
Moving the Food Program Forward	29
The Components of Gorbachev's Agricultural Strategy	29
Restructuring Investment	29
Streamlining the Bureaucracy	33
Improving Economic Incentives	37
The Private Sector	42
Potential Impact	43

SUMMARY

Since becoming General Secretary, Gorbachev has assigned high priority to improving efficiency and reducing the enormous costs of food production. A major element of his program is to accelerate the shift in the share of investment away from farms and into development of rural infrastructure, food processing, and the industries that support agriculture with machinery and chemicals. He is also striving to restructure the agro-industrial sector to eliminate interdepartmental conflicts and better synchronize the process of moving food products from farms to retail outlets. Finally, Gorbachev is anxious to replace "administrative means" with stronger economic incentives as a means of regulating enterprise activity.

These proposals build on the 1982 Brezhnev Food Program and, in concept, represent a fundamental attack on the problems of food production. Gorbachev has made a good start in implementing at least some of his ideas. He has replaced top agro-industrial officials with his own associates and made major cuts in administrative staffs. He has also merged five ministries and one state committee into a state agro-industrial committee that is intended to have broad authority to plan and finance activities of all branches concerned with production and processing of food and natural fiber. In addition, a decree on agro-industrial management was issued in March 1986 that gives farms and local authorities more control over disposal of above-plan production and allows the sale of more produce, particularly perishables, at market-influenced prices. This decree also provides for the transfer of all production subunits on farms and in other agro-industrial enterprises to the collective con-

*Office of Soviet Analysis, Central Intelligence Agency.

tract system of labor payments that makes financial rewards for workers somewhat more dependent on results. Finally, Gorbachev has promised to come up with specific proposals for improving planning, financing, and incentives in time for the 1991-95 Plan.

Effective implementation of programs adopted to date requires, first, that resistance to the reorganization be overcome and that new lines of authority be put in place. Second, if the investment program is to pay off, there must be some success in the campaign to modernize industry. Finally, Gorbachev must follow through on his stated intent to provide an economic environment that relates rewards to effort. This requires a pattern of incentives to induce managers of farms, and of transportation, marketing, and processing organizations to carry out their functions in an efficient and timely manner.

If Gorbachev's proposals are implemented, they are likely to result in some progress toward improving per capita consumption of quality foods and in reducing demand for food imports. These proposals, however, dodge the very difficult and controversial issues of major reforms in prices, incentives, and decisionmaking latitude for farm managers, and therefore are not sufficient to achieve productivity gains large enough to reduce costs, subsidies, and the flow of resources to food production. Although Gorbachev has acknowledged that his present program is only a first step he does not appear ready at present to pursue additional, fundamental reforms. He undoubtedly perceives that such reforms carry unacceptable risks at present because they would threaten the prerogatives of the firmly entrenched party and government bureaucracies and might cause economic dislocation in the short run. Apparently he has achieved a consensus in the Politburo on the major aspects of his program, but those elements of the March 1986 decree that allow an expanded role for market forces appear to be the subject of continuing controversy. Gorbachev himself will probably wait to assess the results of the present program before seriously considering more radical alternatives.

BACKGROUND

General Secretary Gorbachev has inherited an inefficient food production sector that has one-third of all fixed capital (excluding housing and services) but provides a diet well below that of other industrialized countries in terms of quality and variety.¹ The legitimacy of Gorbachev's economic and social revitalization programs will be judged, in part, by his ability to improve the quality of the Soviet diet. At the same time, he needs to raise productivity in this sector so that he can shift resources from agriculture to his industrial modernization effort.

The economic burden of agriculture has increased substantially. The farm sector alone absorbs about 20 percent of the labor force and investment resources (excluding housing and services) compared with less than 5 percent in the US. In addition, state subsidy

¹ Traditionally in Soviet usage, the food production sector, or "agro-industrial complex" includes agriculture, organizations supplying goods and services to agriculture such as fertilizer, pesticides, machinery, repair and other services; procurement agencies, food processing enterprises, and trade organizations.

payments to cover the difference between very low state retail food prices and procurement prices paid to farms have tripled since the early 1970's. The additional fixed capital needed to generate an additional ruble's worth of farm output, furthermore, has gone up by four times and is now three times as high as comparable capital requirements in industry. Finally, hard currency outlays for farm products are about four times the level of the early 1970s', accounting for one-third of hard currency imports.

The leadership has acknowledged that problems not related to weather have contributed substantially to the high costs and inefficiency in food production. First, a proliferation of specialized administrative bodies—developed as part of efforts to address agricultural problems—has led to bloated administrative staffs. In the absence of a mechanism to regulate the relations of these "partners," bureaucratic self-interest has encouraged the pursuit of narrow and often conflicting goals. Excessive interference in local farm management has led to inefficient production decisions and encouraged irresponsibility among farm managers. Inefficiency has also been promoted because financial incentives for farm workers do not depend sufficiently on the size and quality of the harvest. In addition, a lack of rural roads and storage capacity has led to large losses. Moreover, inadequate housing and rural living conditions have encouraged younger, better educated workers to migrate to cities. Finally, there have been deficiencies both in quality and quantity of industrial inputs to farms and food processing enterprises.

The Soviets made a major effort to rectify these problems with the May 1982 Brezhnev Food Program. It was a package of measures designed to improve the efficiency of food production through "unified management" of all branches of the agro-industrial complex. The program also contained an investment program to upgrade the system of storing, handling, and processing of food. In addition, there were financial incentives to foster higher output and retention of younger workers.²

The Food Program was flawed in a number of respects. Its organizational measures included concessions to the interests of the central branch agencies which made integration largely unworkable.³ It also failed to come to grips with more fundamental problems of linking rewards to performance, giving farms freedom to make production decisions, and instituting a rational price system that would elicit the right mix and volume of farm output and inputs.

Nevertheless, Soviet citizens experienced an increase in per capita consumption of quality foods during the first three years of the Food Program (1983-85). Despite drier and therefore less favorable growing conditions, the regime was able to boost forage crop production substantially and increase the production and distribution of fertilizer and other agricultural chemicals. Increased feed availability, milder winter weather, and improved feeding practices

² The Food Program was published in *Pravda*, 27 May, 1982, pp. 1-4.

³ In the Food Program, farms, service organizations, and local food processing enterprises were subordinate both to their parent ministries and to the rayon agro-industrial association (RAPO). This "dual subordination" prevented RAPOs from gaining sufficient authority to make service organizations responsive to the needs of farms.

allowed the livestock sector to continue steady growth which began in 1980. Modest gains were achieved in the production of fruits and vegetables. Progress in production of other important crops since the Food Program has been negligible, however, with average annual production of grain, potatoes, sugarbeets, and oilseeds below 1976-80 levels.

While the regime has made progress in per capita consumption, the Food Program has done little to lower costs of production, raise productivity and reduce waste. In fact, per capita food imports in 1983-85 were 60 percent above their mid-1970's levels. Furthermore, there was no apparent improvement in transportation and storage. Since the Food Program, production costs for major farm products have continued to rise and gains in productivity have been small.

MOVING THE FOOD PROGRAM FORWARD

As Brezhnev's agriculture secretary, Gorbachev was a major architect of the Food Program, but his speeches at the time reflected dissatisfaction with some of the compromises. Since Brezhnev's death in late 1982, Gorbachev has sought to use his growing influence to reshape the program to reflect more closely his own views and priorities. In particular, he has sought to go faster and further than originally planned in shifting investments within the agro-industrial sector. He has also pushed for a substantial modification of the organizational structure of the Food Program. He has put greater stress on the importance of economic mechanisms of control and material incentives in general. Finally, he has promoted the private sector in agriculture as a valuable adjunct to the socialized sector.

Gorbachev's influence in changing the pace and focus of the program was apparent during Andropov's brief tenure, but Chernenko's subsequent, equally brief tenure was generally a period of marking time. It was not until Gorbachev took over as General Secretary in March 1985 that he was in a position to set forth fully his plans for implementing the Food Program.

THE COMPONENTS OF GORBACHEV'S AGRICULTURAL STRATEGY

RESTRUCTURING INVESTMENT

Gorbachev appears to have been the driving force behind the Food Program's investment strategy—concentrating resources where they would do the most to improve efficiency and reduce waste—and he has consistently pushed for more energetic measures to carry out this strategy. In his report to the 27th Party Congress, he highlighted the fact that losses of farm products amounted to 20 to 30 percent, adding that the cost of eliminating losses would be one-third to one-half the cost of obtaining the same supply through additional production. In particular, he has argued for a more rapid shift away from the traditional concentration of resources on farm production—livestock facilities, land reclamation, and so forth—to industries that supply the farm sector with goods and services and to those that process its output. Improve-

ment of rural infrastructure—housing, roads, and storage—also has high priority.

According to Soviet statistics, a shift away from facilities for use in farm production took place toward the end of the 1981-85 period, presumably reflecting Gorbachev's growing influence. During this period, the share of investment in housing and rural amenities showed a comparatively large increase. There was a slight increase in the share for machinery production, food processing, and other elements of the nonfarm sector.⁴ Nevertheless, Soviet statistics show that the distribution of capital stock in the agro-industrial complex changed little during 1983-84 (table 1).

TABLE 1.—USSR: DISTRIBUTION OF CAPITAL STOCK IN THE AGRO-INDUSTRIAL COMPLEX ¹

	[In percent]	
	1983	1984
Total.....	100.0	100.0
Branches producing machinery and other inputs	9.0	9.1
Construction ²	7.3	7.2
Agriculture and forestry	64.5	64.6
Food processing	11.8	11.9
Procurement and retail trade ³	7.4	7.2

¹ Reproducible fixed assets excluding housing and services.

² The definition of this category is not available. It probably includes capital stock belonging to organizations that carry construction and land reclamation for farms.

³ Includes retail trade in food products and public dining.

Farm machinery

Gorbachev appears to have had some success during Andropov's tenure in supplementing the original goals of the Food Program for investment in farm machinery production. A party-state decree on agricultural machinebuilding published in April 1983, apparently earmarked an additional 5.6 billion rubles for this sector over and above what had been called for in the Food Program. In a reference in 1985 to this measure, Gorbachev noted that it was beginning to show good results.⁵ Soviet statistics confirm that between 1983 and 1984, machinery producers—particularly producers of tractors, agricultural machinery, and repair facilities for farm machinery—attained the largest increase in the share of capital stock among the various industries that provide agriculture with inputs (table 2). Producers of agricultural machinery are likely to achieve comparatively large increases in capacity in the 12th Five Year Plan as a result of the rapid growth planned for the machinebuilding sector as a whole.

⁴ Because detailed consistent plans for investment in the agro-industrial complex during 1986-90 have not been published, there is presently no precise statistical evidence on the extent to which these shares are scheduled to shift over the next few years.

⁵ The 5.6 billion rubles apparently is to be spent over the period covered by the decree (1983-90). Under these circumstances, annual outlays would be 700 million rubles, equal to approximately 5 percent of annual investment in the machinebuilding industry.

TABLE 2.—USSR: DISTRIBUTION OF CAPITAL STOCK IN INDUSTRIES SUPPLYING AGRICULTURE AND FOOD PROCESSING WITH INPUTS ¹

	[In percent]	
	1983	1984
Total.....	100.0	100.0
Tractors, agricultural machinery and repair.....	55.3	56.3
Machinery for food processing.....	3.1	3.1
Fertilizer and chemicals.....	34.3	32.8
Other ²	7.3	7.8

¹ Reproducible fixed assets excluding housing and services.

² Includes peat extraction for agricultural use and assets of the microbiological industry.

Progress in actual machinery production has been mixed. In 1985 production of machinery for livestock and feed production grew at faster rates while growth rates fell for machinery involved in crop production. Gorbachev noted in November 1986, moreover, that development of new machinery is lagging and that quality is still very low.⁶

Storage and Transportation

Gorbachev has been particularly critical of the failure to follow through on the Food Program's plans for investment in storage and transportation. "Despite frequent talk of the importance of developing them," he complained in 1985, "no perceptible improvement is yet visible, and nearly one-fifth of the harvest continues to be lost."⁷ The Food Program called for storage capacity to be built on farms and in food-processing enterprises. Farms were also to receive more storage capacity for perishable inputs such as fertilizer and livestock feed, but frequent complaints by Soviet officials suggests that little progress has been made. The paucity of data on storage capacity makes it impossible to measure progress and to assess future plans in detail.

The Food Program plan for improving transportation is centered on expanding and improving the network of interfarm and farm-to-market roads and providing more vehicles such as refrigerator trucks, milk tankers, and cattle trailers. Investment in paved roads is needed badly to reduce high transportation costs and reduce losses in marketing farm products. Soviet sources claim, for example, that only 20 percent of the roads used to move workers to jobs, feed to livestock, and machinery to fields are paved.

Food Processing and Packaging

Gorbachev has assigned the highest priority to upgrading food-processing and packaging equipment in the 1986-90 Five Year Plan. Soviet goals include reduced energy consumption and labor requirements in food processing, increased quality and variety of food products available to consumers, reduced losses and transportation costs, and extended shelf life of food products.

In one of his earliest speeches as General Secretary,⁸ Gorbachev charged that work in carrying out the Food Program goals for

⁶ Foreign Broadcast Information Service, *Daily Report: Soviet Union*, 10 November 1986.

⁷ *Pravda*, 12 June 1985.

⁸ *Kommunist*, no. 9, June 1985, pp. 13-40.

building up the material-technical base of the food-processing industry was lagging badly.⁹ On two separate occasions during 1985, the Politburo approved measures for the development of this sector that presumably involved the allocation of additional funds. Premier Nikolay Ryzhkov stated in his 27th Party Congress speech that priority in the agro-industrial complex will be assigned during the 12th Five Year Plan period to the sectors processing agricultural raw materials and that capital investment in these sectors will increase by 51 percent—from 26 billion rubles in 1981–85 to 39 billion rubles in 1986–90.¹⁰

Housing

The heavy emphasis in the Food Program on improving living conditions in Soviet rural communities resulted in a sharp rise in the share of farm investment going for “nonproductive” purposes—housing, schools, and so forth—in 1985. Commissionings of rural housing, furthermore, which declined steadily in the 1960’s and 1970’s, not only increased during 1981–1985 but also grew more rapidly than commissioning of urban housing. Nevertheless, during this period growth declined in the employment of workers that better housing is intended to attract—such as agronomists, veterinarians, and drivers of tractors and grain combines.

Other Investment Priorities

Improvement in on-farm technology depends in part on following through on Food Program plans to increase supplies of fertilizer, pesticides, and livestock feed supplements. Fertilizer and pesticides are key inputs for the “intensive technology” effort endorsed by Gorbachev to increase grain production. Growth rates for deliveries of these products to agriculture have picked up sharply since the introduction of the Food Program.¹¹ Nevertheless, there are frequent complaints in the Soviet press about shortages of fertilizer-application machinery and improper application techniques on farms. Furthermore, total supplies of agricultural chemicals are still far short of needs.

Taking Money From Traditional Areas

Gorbachev has been far more emphatic than Brezhnev in insisting that the restructuring of investment within the agro-industrial complex should not entail an increase in its overall share. “We have reached the limits of building up capital investment in this sector,” Gorbachev bluntly told a June 1985 conference.¹² He went out of his way to note approvingly that the resources allocated in mid-1983 to agricultural machinebuilding had been taken from the farm sector and indicated that he favored further shifts of this sort.

⁹ According to Soviet statistics, annual commissionings of new capacity for processing meat, dairy products, and vegetable oil have not increased substantially since the Food Program was implemented.

¹⁰ *Pravda*, 4 March 1986. This amount probably includes investment in food processing capacity on farms as well as investment in food-processing industries. It also probably includes investment in those branches of light industry that process natural fiber.

¹¹ Fertilizer deliveries to agriculture grew at an average annual rate of 8.0 percent in 1983–85 compared with 3.6 percent in 1981–82 and 1.7 percent in 1976–80.

¹² *Kommunist*, no. 9, June 1985, pp. 13–40.

Gorbachev, who has emphasized raising yields through better use of existing reclaimed lands rather than undertaking new projects, appears to have been successful in cutting back on the large amount of resources going to the land-reclamation program.¹³ References to the completion of feasibility studies for the ambitious Siberian river diversion scheme were dropped from the draft guidelines for the 12th Five Year Plan published in the fall of 1985. Moreover, several other water diversion projects that were included in the draft guidelines subsequently came under sharp public attack from eminent academicians, including Gorbachev's reputed adviser Abel Aganbegyan, and were removed from the final version of the plan approved at the 27th Party Congress in February and March 1986. Finally, a decree was published in August 1986 announcing the termination of all planning and preparatory work on both the northern and Siberian river diversion projects.

STREAMLINING THE BUREAUCRACY

Gorbachev has viewed the central bureaucracy, with its organization along narrow departmental lines, as the main obstacle to his plans to redirect investments, resolve interbranch conflicts, and transfer greater authority to the regional and enterprise levels. Not surprisingly, Food Program initiatives to coordinate the management of the entire food-production and distribution process were effectively quashed by the ministries and state committees that stood to lose authority if a regionally oriented system were fully established. The district-level commissions (RAPOs)—the Program's solution to coordinating agricultural decisionmaking at the crucial local level—were never effectively established. Many RAPOs exist in name only. Few have gained sufficient authority to even attempt to operate as originally envisioned.

On becoming General Secretary, Gorbachev acknowledged the inadequacy of the 1982 organizational measures and pushed hard for more extensive management restructuring that would streamline decisionmaking and establish clear lines of authority. In one of his first speeches as new party boss, Gorbachev bluntly reminded Central Committee members: "We agreed at the May 1982 plenum that the agro-industrial complex should be planned, managed, and financed as a single entity at all levels. We must carry this to its logical conclusion."¹⁴ Such a broad interpretation of the Food Program was intended both to justify the creation of a central coordinating body with more teeth than the existing commission and to give RAPOs enhanced authority, at the expense of the central ministries, to distribute resources earmarked for their districts and assign production plans among association partners.¹⁵

¹³ Since the mid-1960's, investment in irrigation and drainage projects has consumed almost one-fourth of total investment in agriculture. According to Soviet calculations, returns on these investments have been lower than those for other major investment projects in agriculture.

¹⁴ *Pravda*, 24 April 1985.

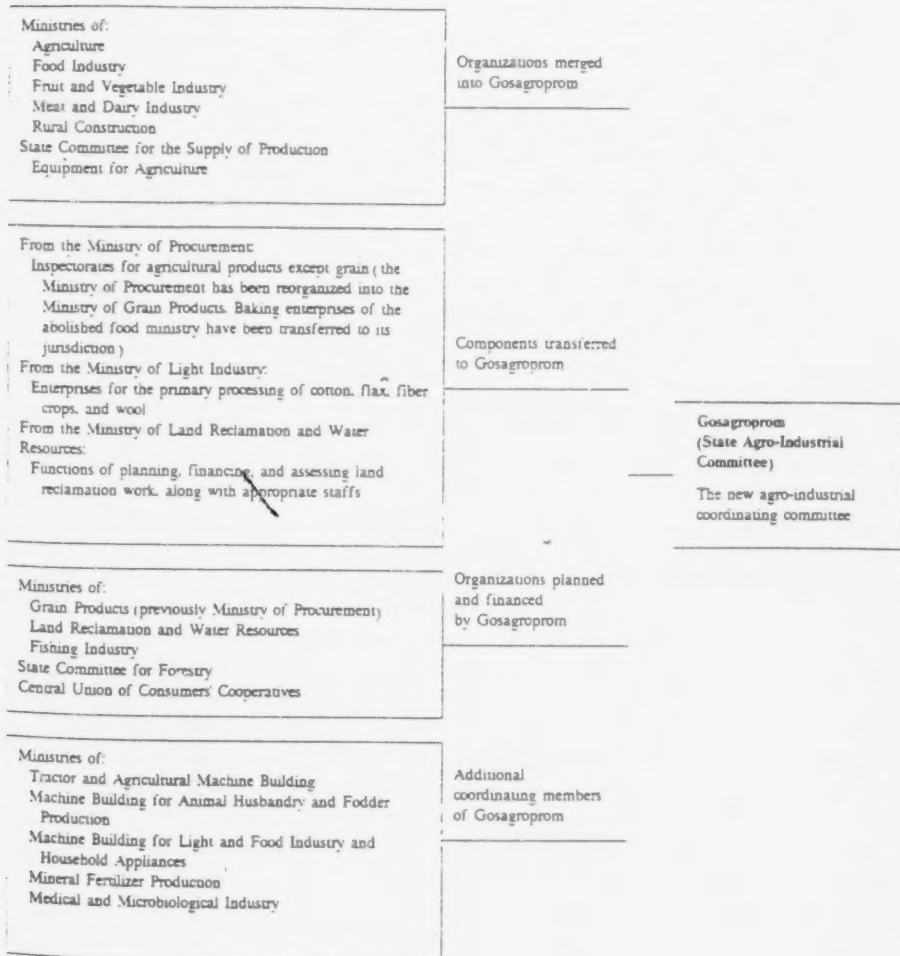
¹⁵ Gorbachev's interpretation appears to reflect the views of two reformist economists connected with Gosplan's agro-industrial section. One of these economists, Vladimir Miloserdov, has written a number of articles arguing that the concept of creating unified management and planning of the agro-industrial complex at all levels logically means that material and financial resources should pass down to the individual enterprises through one channel, that of the agro-industrial bodies, and not through many different branch channels.

This call was followed by a November 1985 decree establishing a USSR Union Republic state agro-industrial committee (Gosagroprom) with broad authority over all components of the agro-industrial sector. While the Food Program's Agro-industrial Commission served a coordinating function—in effect working with the various ministries involved with agriculture—Gosagroprom has been given substantial line authority. The committee merges five ministries and one state committee and includes elements of three other ministries (figure). The Ministry of Procurement—reorganized into the Ministry of Grain Products—and the Ministry of Land Reclamation were not included in the merger, but Gosagroprom as the “central organ of management of the agro-industrial complex” was given the authority to plan and finance their activities and that of all other branches concerned with the production and processing of food and natural fiber.¹⁶ Ministries involved with the production of material and technical inputs for agriculture and the food industry have been enjoined to coordinate their activities with Gosagroprom and are included on the committee as members.

¹⁶ The exclusion from the merger of the reorganized Ministry of Grain Products is puzzling. This arrangement may only be temporary, but it is also possible that it is intended to allow the regime to retain tight control over grain—the most important basic crop—while permitting more local control over other agricultural produce.

Figure

The New Organization of the Agro-Industrial Sector: Gosagroprom



The reorganization was accompanied by a major cut in administrative staffs. Soviet officials stated that 47 percent of the personnel in the central apparatuses of the abolished agricultural ministries have been let go, either transferred to jobs at the production level or fired.¹⁷

Gosagroprom is intended to put an end to the special-interest lobbying, which often encouraged previously existing ministries to work at cross-purposes. Gosagroprom is supposed to have a vested interest in seeing that the entire input-production-processing chain runs smoothly, as well as the latitude to make the requisite resource-allocation decisions. After the reorganization, however, Gosagroprom went through a difficult shake-down period. Party secretary Nikonov complained in May 1986 that the functions of the subdivisions within Gosagroprom and the duties of each worker had not yet been clearly defined, resulting in a lack of coordination and efficiency and an unwillingness on the part of many specialists to accept responsibility for resolving questions.¹⁸

The reorganization was intended to be the first step in shifting more decisionmaking authority to the regional and enterprise levels. At least on paper, the reorganization eliminates the dual subordination of enterprises that plagued the RAPOs and opens the way for strengthening their role in planning and resource allocation. Provisions enhancing their authority were spelled out in the revised RAPO statutes issued in March 1986.¹⁹ Lack of progress in implementing these measures, however, has caused concern in Moscow.²⁰

Moscow's slow progress in delegating decisionmaking to the regional and local levels is not too surprising. Besides having to deal with bureaucratic footdragging, Gosagroprom must weed out deadwood, select regional officials, and establish its own role within the Council of Ministers. Even when Gosagroprom is fully operational, there is no guarantee that it will be able to effectively delegate authority to farms. Local party leaders have traditionally played a major role in resource allocation and production decisions within their respective regions. As long as local political officials—whose interests may not coincide with those of their farm managers—retain decisionmaking control, decentralization measures may have only limited effect.

Effective delegation of decisionmaking authority to the local level, however, is also dependent on the far more challenging issue of establishing a set of economic incentives that will ensure that this authority is properly exercised at each level—that the RAPO, in particular, does not become one more bureaucratic layer impinging on the operational autonomy of farms.

¹⁷ Foreign Broadcast Information Service, *Daily Report: Soviet Union*, 4 February 1986.

¹⁸ *Voprosy istorii KPSS*, May 1986, pp. 3-18.

¹⁹ *Sobraniye postanovleniy pravitelstva soyuza soveskikh sotsialisticheskikh respublik*, no. 16, 1986, pp. 250-264.

²⁰ Party secretary Nikonov charged that the apparatus of Gosagroprom at the national level was continuing to examine questions that should be resolved at the local level just as the former ministries had. (*Voprosy istorii KPSS* May, 1986, pp. 3-18.) He went on to complain, as did Murakhovskiy (*Kommunist*, April, 1986, pp. 23-35.) that "old-style departmentalism" was also making its presence felt in the new organizations at the regional level, and he criticized the failure of many regional Gosagroprom officials to move more quickly in including agricultural-related enterprises in the RAPO structure.

IMPROVING ECONOMIC INCENTIVES

Gorbachev has repeatedly emphasized that changing the role of ministries and giving the RAPOs and farms greater autonomy cannot be fully accomplished unless accompanied by stronger economic incentives as a means of influencing enterprise activity and has stressed the need to overhaul the existing system of economic levers. His rhetoric—his repeated call since the 27th Party Congress for “radical reform,” for instance—suggests that he is inclined toward and would support fairly major changes, and he has pressed hard for the implementation of a number of specific policies that, although not new in themselves, may push the regime in the direction of more meaningful reforms. He has, however, avoided any concrete proposals for basic changes in the system of economic incentives. Gorbachev acknowledges that coming to grips with this issue is the most controversial, complex, and difficult aspect of his program.

Self-financing

Gorbachev has attached particular importance to the introduction of self-financing—requiring enterprises to finance their operations out of their own revenues—as the main vehicle for creating positive incentives for producers and as a prerequisite for managerial autonomy. While self-financing has been a regime goal for years, it has largely been introduced only on paper and has not been an effective means of increasing farm accountability.

On becoming party secretary for agriculture in 1978, Gorbachev argued for the need to create more “profitable” conditions for farms and began to work in other ways to make self-financing a more meaningful proposition. Gorbachev has since called for putting all management and production units on a self-financing basis. He has stressed in particular that “contracting brigades”—an innovative form of organizing labor on the farms that he began pushing most vigorously during Andropov’s tenure—should also operate on a self-financing basis.²¹

Although self-financing has the potential to encourage greater responsibility on the part of farm management and labor collectives for the efficient use of resources allotted to them, it does not provide the incentives of true profit and loss accounting because farms do not face rational procurement prices or have enough choice about what to produce, what inputs to purchase, and how to spend their profits. The system of centralized allocation of material resources means that deliveries of goods to farms are planned in physical terms and that farms must pay for them regardless of utility or quality, a situation that has a negative impact on production costs. Self-financing is also weakened by the payment of high minimum wages and by writing off debts of unprofitable farms.

²¹ The semiautonomous brigades or teams operate under a contract with the farms and are given latitude to manage the production process as they see fit. During the growing season, workers receive monthly cash advances. After the harvest, wages are increased if crop yields or livestock production have improved. Problems that are being encountered in implementing collective contracts include inadequate supplies of machinery and fertilizer, insufficient skills and high turnover among personnel, and lack of financial incentives for farm managers to operate under this system.

Most of all, self-financing has been undermined by the existing price system. Specifically, rigid, centrally set prices do not cover costs for some farm products and cannot take into account the impact on costs of constantly changing growing conditions and the extreme differences in soil and climate that exist from region to region. As one farm chairman put it: "Financial autonomy remains just wishful thinking as long as there are such wide swings in earnings from good to bad years. How is it possible to expect farms to finance their own development when incomes swing from huge losses to enormous profits?"²²

Gorbachev is well aware of these basic obstacles to the implementation of fully effective self-financing and acknowledges that changes in the economic system are required. He has argued that the practice of automatically bailing out the farms breeds irresponsibility and in his congress report urged that the system of bank credits be "substantially altered." He has also called for a more rapid shift to a system of wholesale trade to increase the reliability and timeliness of industrial deliveries to agriculture.²³ While Gorbachev has not taken as reformist a stand on prices as some economists and clearly does not have in mind abandoning the system of officially administered prices, he has called for more price flexibility, noting in his party congress speech that prices should be "co-ordinated" with consumer demand.

Public exhortation for change notwithstanding, Gorbachev is well aware that he lacks a significant bureaucratic constituency for reform measures. He appears to be pushing self-financing partly as a way to define and highlight the problems and, more important, to help build broadly based support for a program of change that is necessary if it is to work. While little progress has been made in formulating a comprehensive reform package, a few initial steps have been taken. A major decree on agricultural management issued in March 1986 after the party congress includes some measures aimed at improving the "economic mechanism" and the conditions for farm financial independence and lays the groundwork for some other changes in the future.

March 1987 Decree on Agricultural Management

In his 27th Party Congress report, Gorbachev unveiled a scheme to give regional party officials and farms greater control over the disposal of above-plan production and allow the sale of more produce, particularly perishables at market-influenced prices. Gorbachev repeated a promise often made in the past, but never kept, that farms will be given stable annual procurement quotas for the entire five-year period. What they produce in excess of these quotas they may dispose of at their own discretion: either keep for internal use, or sell on the collective farm market, through the consumer cooperative network, or to state procurement agencies. Gor-

²² *Sel'skaya zhizn'* 17 May 1984. Some reform-minded economists have gone further in explicitly arguing that a major price reform is needed—one that would reflect scarcity and would balance supply and demand. For example, agricultural economist Ivan Buzdalov insisted that "a comprehensive approach to price formation presupposes a consideration of general market laws of supply and demand." *Voprosy ekonomiki*, no. 5, April 1985, pp. 124-135.

²³ *Pravda*, 26 February 1986.

bachev described this scheme as a contemporary version of Lenin's tax in kind (*prodnalog*).²⁴

The decree incorporating Gorbachev's congress initiative includes a complex array of changes in planning, procurement, and marketing procedures, which are intended to provide the farms better incentives and improve conditions for their financial independence.²⁵ The decree was not, however, the bold new program that Gorbachev's reference to *prodnalog* seemed to promise. While some of the measures in the decree are promising, none is radically new, and much that has promoted economic inefficiency in the past has been retained. First, farm autonomy is not enhanced in any important way. Farms will continue to receive plans for sales, investment quotas, and input deliveries. In addition, elements that tend to undermine self-financing such as minimum wages and measures to bail out unprofitable farms, are preserved. The overall level of procurement targets, furthermore, is not reduced—a change necessary to give full play to the concept of *prodnalog*. In fact, the targets for grain procurement may have been increased. Finally, the system of bonuses for above-plan procurements—which causes large fluctuations in farm income—was preserved, and, in the case of grain, was enhanced.

Because the decree specifies that procurement targets are to be set at least at the 1981–85 level, much of the flexibility granted to farms and local officials by the decree will apply only to what they can produce above plan. Moreover, a key factor will be whether procurement quotas, once set, remain unaltered, releasing farms from the vicious circle in which increased production is inevitably followed by an increased quota. Regime officials appear determined to adhere to their promise of stable plans for this five-year period, but farms may continue to seek understated plans anticipating a big jump in procurement targets in the next five-year plan.

While the decree is not likely to have a substantial impact on productivity, it holds out some promise of reducing losses and improving local food supplies. Specifically, officials at the oblast and republic level are given greater responsibility for managing local food supply. They will continue to receive centrally set procurement targets for deliveries into all-union and republic stocks, but, starting in 1987, procurement targets for agricultural produce destined for "local supply" will be set by officials at the oblast and kray level. In the case of republics that have no oblasts, targets will be determined at the republic level.²⁶

Local authorities are also authorized to exchange food products with other regions instead of channeling all requests through Moscow—a measure that could improve food distribution. More important, union republics will be able to set procurement prices for

²⁴ The tax in kind was a measure introduced in 1921 that put an end to the policy of confiscating all farm surpluses and opened the way for the New Economic Policy with its more tolerant attitude toward private enterprises and the market. The measure established a progressive tax in kind that was deliberately set very low. The peasants were permitted to sell their after-tax surplus on the open market.

²⁵ The decree was published in *Pravda*, 29 March 1986.

²⁶ This procedure appears to be drawn from an experiment in Lithuania that began several years ago. Problems developed, however, because even though procurement targets for local supply were set locally, central authorities continued to hand down specific plans for what should be produced by whom and in what quantities.

individual farm products as long as the total procurement budget is not exceeded.²⁷ By adjusting prices, and therefore profits, local authorities will be able to increase the willingness of farms to produce products called for in the plan but that at present provide little profit. While this measure will not reduce costs or subsidies, it could increase the assortment of products procured in a given area.

It seems clear that the regime hopes to channel more food products through the consumer cooperative network—a quasi-independent organization that sells food at retail prices somewhere between the low state store prices and the much higher prices at the collective farm markets. Meat and poultry products raised under contract with private plot owners, for example, will be sold through consumer cooperatives rather than through state procurement channels.²⁸

Farms are given the most flexibility in disposing of perishable produce such as fruits and vegetables, for which timely delivery to stores is vital and where losses have been greatest—at least 40 percent in the case of fruit. This seems to be one area where Gorbachev's call at the congress for coordinating prices with supply and demand will be applied. Individual farms will continue to be able to sell their above-plan produce where they can get the best price. Moreover, the quota for fruit and vegetables that they can sell to consumer cooperatives or on collective farm markets that will count toward fulfillment of the procurement plan has now been raised from 10 to 30 percent.

Agricultural officials express the hope that these measures will improve the quality and profitability of production and help drive down prices on the collective farm markets. Any sizable increase in the sale of fruits, vegetables, and meat to the consumer through nonprocurement channels would also help reduce the burden of state subsidies somewhat.²⁹ The consumer would face a rise in the average retail price of these products, but the resulting improvement in quantity and assortment should help compensate.

The degree of success the regime has had thus far in selling these measures, however, is small. For the three years during which the farms had the right to sell 10 percent of their procurement quota for fruits and vegetables on the collective farm market or to consumer cooperatives, very little advantage was taken of it.³⁰ Official public attention to this measure, furthermore, was negligible. In contrast, Gorbachev's supporters seem determined to move aggressively in promoting the present expansion of farm

²⁷ It is not clear from the decree whether this applies to all products or only to those procured for local supply.

²⁸ In his speech to the 27th Party Congress, the chairman of the Central Union of Consumer Cooperatives, Mikhail Trunov, claimed that 3 billion rubles would be allocated during the 12th Five Year Plan to improve the cooperatives' logistical base—as much as had been allocated for this purpose in the entire 20 years past. He indicated that major attention would go to building up interregional trade capabilities, the weakest link in the Soviet food distribution systems.

²⁹ Any reduction in subsidies from higher retail prices, however, probably will be offset by the effects on grain procurement prices of doubling the bonus for above-plan sales—especially in years of large harvests.

³⁰ Less than 5 percent of potatoes, meat, and milk marketed by farms in 1984 was sold to purchasers other than state procurement agencies. Sales of vegetables and eggs through cooperatives and collective farm market channels was slightly larger, but still no more than 10 percent of marketings.

rights to sell through nonprocurement channels. Cases of local obstructionism have been publicly scored. Nevertheless, by the end of 1986 harvest, Soviet reports indicated that only two percent of vegetables and less than one percent of potatoes had been sold through these channels.³¹ As farms come under increasing pressure to become financially independent, however, they may take a greater interest in the opportunities afforded by measures in the decree.³²

The Second Stage

The March decree is clearly intended as an interim measure. It calls for further economic experiments to improve planning, financing, and the incentive system with proposals to be elaborated by the 1991-95 plan.³³ This seems consistent with Gorbachev's timetable for reform throughout the economy—experiments and initiatives that promise quick gains now, laying the groundwork for more fundamental reforms in the second stage.

Public debate on reform issues, moreover, has picked up since Gorbachev came to power. What is particularly notable is the attention that reformist proposals are receiving in the mass media. Ideas that in the past would have appeared, if at all, only in obscure journals are now often vetted in the central press. Television has also provided a vehicle for the exposure of controversial ideas.³⁴

Several experiments incorporating elements of Gorbachev's proposals for management and planning reforms and for improving the economic mechanism are now being conducted at the regional level. They provide a clearer picture of the changes that Gorbachev would like to introduce than can be gleaned from his speeches. All of the experiments are aimed at enhancing authority at the local level and point up the potentially reformist thrust of Gorbachev's approach. A number of elements of these experiments have now been included in the March decree.³⁵

³¹ The statement presumably refers to shares of planned procurements of these products. Foreign Broadcast Information Service, *Daily Report: Soviet Union*, 6 November 1986.

³² There are nevertheless signs that opinions within the top leadership differ on the role that market influences should play under conditions of the March 1986 decree. Gosagroprom head Murakhovskiy described the decree as "exclusively" devoted to strengthening and developing "commodity-money" relations (Soviet jargon for market forces), and he focused at length on those measures in the decree that allow some greater pricing and market flexibility. (*Kommunist*, April, 1986.) In another discussion of the decree, President of the Academy of Agricultural Sciences and longtime Gorbachev associate Aleksandr Nikonov implied that the concept of *prod-nalog* would be expanded. Party secretary for agriculture Viktor Nikonov, on the other hand, avoided any reference to the specific market-related elements of the decree entirely. *Voprosy istorii*, no 5, May 1986, pp. 3-18.

³³ Specifically, the decree calls for a shift from the present system of directive planning of farm production to a "normative" method based on an economic assessment of the farms' land, capital stock, and labor resources.

³⁴ In the summer of 1985, for example, the TV news carried an interview with an eminent agricultural economist, Vladimir Tikhonov, in which he spelled out in very straightforward language a comprehensive proposal for radical reform of agricultural management that appeared to go almost as far in reducing central administrative controls as that accomplished in Hungary. Tikhonov advocated, among other things, that farms should have the right to choose their own suppliers, decide on their own production structure, and sell their produce to whom they choose. Prices would be more flexible, floating between set limits. A system of taxes would ensure that what was profitable for the farms was also what was wanted by society as whole. He indicated that his institute had suggested to higher authorities that these ideas be tried out on an experimental basis in several Soviet republics.

³⁵ In the Kuban area, for example, an agro-industrial combine includes all farms and food processing enterprises in the district. The combine is self-supporting, makes its own production

Continued

Even these experiments, however, dodge the most difficult issues of price formation and farm manager autonomy. Even reform-minded economists are deeply divided over what the proper role of prices should be. In interviews with Western newsmen since the 27th Party Congress, Aganbegyan has expressed considerable pessimism about the prospects for any major price reform in the near future.

Gorbachev is aware of the obstacles he faces in pressing for major reforms. He has gone out of his way, for example, to answer potential critics by emphasizing that his call for flexible prices and greater use of economic means of management does not represent the abolition of central planning or the victory of "spontaneous market forces." He is, moreover, apparently prepared to allow considerable time for economic reform measures to be worked out. Although Gorbachev stated in his congress speech that the Politburo had drafted general guidelines for transforming the economic mechanism, he stressed that this was only the "start of the journey" and that the actual restructuring of the economic system would take both "time and energy." He appeared to indicate that it might be a number of years before a program appears.

THE PRIVATE SECTOR

While Gorbachev's main concern is the revitalization of agriculture's socialized sector, he has been one of the strongest supporters of the private sector, viewing it as a valuable complement to large-scale farming. He was, for instance, closely identified with a 1981 decree that was intended to be a major concession to private agriculture. He has more recently made favorable references to experiments in Georgia and the Baltic republics involving sizable family-run farms operating under contract with the state and has sought in other ways to achieve a closer integration of private and socialized farming.³⁶

The President of the Academy of Agricultural Sciences, Aleksandr Nikonov, stated in 1985 that the role of private plots had probably "stabilized" but he indicated that a more flexible policy would be pursued and that measures would be taken to create better conditions for more efficient use of the private plots. The March 1986 decree, in particular, if fully implemented, may open new opportunities. While the measures to make the state sector more competitive could drive down prices on the collective farm markets, the loss to the private producers could be offset by potential benefits from such measures as the expansion of the consumer cooperative network.

decisions, and sells some of its products at combine-owned outlets for whatever price it can command. In another experiment with decentralized planning, centrally set procurement targets for the Lithuanian Republic only specify the amount of produce to be delivered for all-union supplies, allowing local authorities a greater role in providing local food supplies. This experiment was extended to Stavropol Kray in January 1986 and subsequently elements of it were incorporated in the March decree. Altay Kray has been the site of experiments with more radical forms of self-financing. All of the experiments, however, have encountered resistance from the central bureaucracy.

³⁶ Since the initiation of the Food Program, private-sector production has increased at less than one-half of 1 percent per year, and it fell sharply in 1985. The socialized sector maintained slow but steady growth during this period. For a more complete discussion of private agriculture see the paper by Ann Lane "Private Agriculture on Center Stage," *Soviet Economy in the 1980s: Problems and Prospects*, Part 2. US Congress, Joint Economic Committee, 1982, pp 23-40.

POTENTIAL IMPACT

Gorbachev's attempts to refocus and strengthen the Brezhnev Food Program, even if fully implemented, have only limited potential for improving agricultural performance for the rest of the decade. Moreover, positive effects will not be immediate.

If the reorganization and streamlining of agro-industrial management is carried out according to Gorbachev's plans, it could reduce the bureaucratic haggling and competition, which has traditionally hampered effective decisionmaking. The elimination of dual subordination would facilitate coordination between farms, food processing enterprises, and other elements of the food production chain. The process of redrawing lines of authority and developing a new *modus operandi* for the ministerial reorganization, however, is still far from complete, and old habits and constituencies die hard.

If investment in the 12th Five Year Plan is shifted along the lines suggested by Soviet policymakers, the results of this redistribution, which may take some time to appear, should cut losses caused by poor transportation, storage, and processing and eventually result in more and higher quality farm equipment. Success in the investment program, however, depends on Gorbachev's industrial modernization program.

Increased accountability at the farm level achieved by discipline campaigns and administrative means could bring a somewhat more rational use of inputs, thereby increasing productivity. These gains will be very small, however, unless Gorbachev follows through on his stated intention of improving the economic incentives.

Although the growth targets in the 12th Five Year Plan for the farm sector are undoubtedly out of reach, these initiatives, if implemented effectively and paired with ongoing actions to improve feeding practices, have the potential—barring less favorable weather—to allow the Soviets to make some progress toward two important policy goals: raising per capita consumption and cutting demand for food imports.

First, improvements in storage, transportation, and livestock feeding could contribute to gains in per capita availability of perishable food products including meat. The 1990 targets for per capita consumption of meat, milk, and eggs would be met even if current growth rates only remain constant. Improvements in storage and transportation alone would be insufficient to meet 1990 per capita consumption goals for fruit and vegetables; production of these crops must also be substantially accelerated for this to occur.

Second, there could be some reduction in food imports. Maintaining the 1983-85 growth rates in livestock production would require that grain imports continue, but continued improvement in feeding practices would reduce demand. At the same time, meat imports could be eliminated and butter imports reduced. If past production trends continue, however, prospects would be poor for cutting imports of vegetable oil and sugar.

Limited progress is likely to be made in reducing costs and subsidies over the next few years for the following reasons.

First, continuing the policy of high minimum wages and bailing out unprofitable farms will tend to keep costs high, particularly in poor crop years. Rapid growth in the use of industrial goods in

farm production will tend to raise costs, especially if incentives for farm workers do not improve substantially. While the regime may be able to limit growth in overall investment in agriculture it will be unable to free up investment funds to support industrial modernization.

Second, announced policies are likely to result in higher procurement prices and, in the absence of retail food price increases, higher subsidies. As a result, agricultural subsidies will continue to account for 15 percent or more of the state budget.

Beyond the Food Program

The major productivity gains sought by the leadership depend, in the final analysis, on the implementation of additional organizational and economic measures that effectively link all branches and levels of the agro-industrial sector. Perhaps most important, economic criteria must replace administrative means for regulating farm activity. As long as prices are poor guides to decisionmaking, supplies are centrally allocated, and detailed procurement targets are issued, farms and labor teams do not have the wherewithal to effectively respond to opportunities to improve the mix of inputs and outputs nor can they be held responsible for the results.

While the potential economic gains are certainly attractive, any reform calling for a larger role for market forces and farm autonomy threatens the power and prerogatives of the party and could bring a period of economic instability. While Gorbachev has apparently achieved Politburo consensus on his initiatives thus far, there is apparent disagreement over moves toward market-influenced prices. In all likelihood, Gorbachev himself is hoping that current initiatives, including his campaigns for greater discipline and accountability, will bring notable improvements in the consumer diet while allowing some reduction in the share of resources allocated to the agro-industrial sector.

The leadership will probably discover, over time, that this limited approach will not yield the productivity gains needed to reduce the economic burden of this sector and allow a shift of resources to Gorbachev's modernization effort. This realization, if accompanied by an expansion of his power through the regional as well as the central bureaucracies, may lead the regime to take more radical steps. There are a number of steps that, if taken, would indicate a willingness to make more fundamental changes, these steps might include: expanding the right of local authorities to set some prices in response to changing conditions; reducing interference in day-to-day farm operations by both local and central officials; moving toward lower minimum wages and giving farms more authority over what they pay out; following through on the promise to keep procurement targets stable to expand the amount controlled by farms; and finally, providing local farms with more authority to decide what to produce and greater say over the acquisition of supplies such as equipment and fertilizer.

SOLVING THE SOVIET LIVESTOCK FEED DILEMMA: KEY TO MEETING FOOD PROGRAM TARGETS ^{1a}

By Barbara S. Severin^{1b}

CONTENTS

	Page
Summary	45
I. Importance of the livestock sector	46
II. Feed: Key to livestock productivity	47
A. Feed production lags	50
B. Improving the protein content	52
III. Plans to increase and improve feed supplies	53
A. Growth in production	53
1. Concentrates	54
2. Roughages	55
B. Reducing the protein shortage	56
1. Oilseed meals	57
2. Pulses and other high-protein crops	58
3. Single-cell protein	58
IV. Outlook	59
A. Gains in feed availability	59
B. Gains for the consumer	60
C. More favorable than earlier estimates	60
D. But other outcomes are possible	60

SUMMARY

In large measure, Soviet consumers will judge General Secretary Gorbachev's commitment to their well-being by his ability to put more meat on the table. The Food Program—advanced by Brezhnev in 1982, strongly endorsed by Gorbachev, and largely repeated in targets for the 1986-90 Five-Year Plan, published in November 1985—calls for raising per capita meat consumption by 17 percent from 1985 to 1990. Such an increase would contrast sharply with the near stagnation in meat availability over most of the last decade. Achieving this goal—an outcome this paper finds probable, barring sustained bad weather—would go a long way toward boosting popular support for Gorbachev's regime and, by implication, his calls for greater effort on the part of the Soviet work force.

Chronic shortages of all types of animal feeds have been a major constraint on domestic meat production, but meat output has also suffered from an imbalance among those feeds available—high-protein feeds such as soybeans, concentrates such as grain, and roughages such as hay. The shortage of feed, compounded by these imbalances, explains in large part why the fattening process takes twice

^{1a} This paper expands and extends work presented at the Seventh International Conference on Soviet and East European Agriculture held in 1984. The earlier paper is published in *Organizational Responses to Failing Performance: Socialist Agriculture in Crisis*, Westview Press, 1987.

^{1b} Office of Soviet Analysis, Central Intelligence Agency.

as long as in the United States and requires 1.5 to 2 times as much feed.

To increase the output of product per farm animal, Gorbachev has moved aggressively to implement Food Program initiatives that emphasize the use of roughages and protein in animal diets, provide the resources—including additional fertilizer—for increased production of these components, and enhance feed quality by improving equipment and facilities for processing and storage of feeds. This paper argues that Moscow will make enough progress on these initiatives to result at least in better balanced feed rations per animal. Thus, even with little or no improvement in the rate at which farm animals convert feed to product, larger supplies of feed per animal, together with greater proportional use of roughages in the feed ration should result in an increase in meat per animal and milk per cow. This, in turn, should help to hold down steadily rising meat production costs and put more meat on the table.

I. IMPORTANCE OF THE LIVESTOCK SECTOR

Food accounts for about half of Soviet household expenditures on consumer goods and services. The availability of meat—together with increasing variety in the diet—is a key factor by which Soviet consumers judge their well-being. Although money incomes have grown steadily, the leadership has continued its policy of maintaining stable, relatively low prices in state retail stores—where most meat is sold—in the face of stagnating meat output during the late 1970s and early 1980s. Consequently, demand for meat has grown far more rapidly than supply. Consumer dissatisfaction with the resultant queuing and chronic shortages has contributed to low labor productivity. Production increases of the past three years have not been sufficient to close the gap.

Keeping retail prices constant—the last increase was in 1962—has also led to substantial budgetary drain. According to V.N. Semenov, a noted Soviet budget authority, subsidies for meat alone reached \$19 billion rubles in 1985, compared with an estimated \$13 billion in 1975.² The cost of production and procurement of beef is nearly triple, and that of pork nearly double, the retail price.

To reduce the disparities between supply and demand for meat, the Food Program—first put forth by Leonid Brezhnev in 1982—calls for raising per capita meat consumption from 60 kilograms at present to 70 kilograms in 1990.³ General Secretary Gorbachev

² *Voprosi ekonomiki*, No. 8, 1986, p. 65.

³ *Izvestiya*, 27 May 1982, p. 1. In Soviet terms, meat includes poultry and is defined in terms of slaughter weight, including slaughter fats and edible offals. To be comparable to Western retail measures of meat, roughly 18 percent of the total—slaughter fat and trim—should be deducted.

strongly supports the Food Program. Indeed, he recently noted that "the Party's modern agrarian policy (is) formulated in the Food Program".⁴ Gorbachev clearly recognizes the need for increased labor productivity throughout the economy and sees qualitative improvement in the diet as an important factor in meeting that need. But progress has been slow. At the April 1985 Central Committee Plenum, Gorbachev noted that the Food Program "required particular attention" and "could not be put aside."⁵ His numerous complaints that foot-dragging and "departmental interests" thwart the development of agriculture and related industries highlight this concern. Food Program proponents, however, are encouraged by his repeated statements on the need to improve support services not only to farm production but also to the transportation, storage, and handling network.⁶

II. FEED: KEY TO LIVESTOCK PRODUCTIVITY

Livestock feed comprises concentrates (feeds with high nutritive content such as grain and oilseed meals) and roughages (feeds with high cellulose and/or water content such as hay, silage, potatoes and other feed roots, and pasture).⁷ Animals gain weight more rapidly and require less feed per unit of gain when the ration contains sufficient energy (calories) and is correctly balanced between concentrates and roughages as well as in nutrient content—protein, minerals, vitamins, trace elements, and so on. A ration is considered fully balanced when it achieves the maximum output of product for a given quantity of feed units in the most economical combinations.⁸ Rations that are out of balance add substantially to the cost of livestock products, because larger daily quantities of feed are required to achieve the same amount of product—meat, milk, eggs. Soviet writers estimate that feeding unbalanced rations may increase cost by more than one-third.⁹ In an attempt to match US livestock feeding efficiencies, Soviet animal nutritionists have stressed—too strongly—the importance of increasing the absolute amounts of feed and the share of concentrates in livestock rations, without addressing the need to improve protein content.¹⁰

Indeed, costs of meat, milk, and egg production have risen sub-

⁴ *Pravda*, 26 February 1986, p. 4.

⁵ *Pravda*, 24 April 1985, p. 1.

⁶ *Pravda*, 24 April 1985, p. 1. For an analysis of Gorbachev's views, see "Gorbachev's Agricultural Policy: Building on the Brezhnev Food Program" in this volume.

⁷ Concentrates as reported in Soviet sources exclude those that are of animal origin—meat and bone meal, fish meal, milk, and so on.

⁸ There is no single balanced ration for each animal or group of animals. The same output can be achieved through varying combinations if adequate supplies of needed feeds and supplements are available. This is not the rule for Soviet farms, which often are forced to feed uneconomical rations because crucial elements are not available. In market economies farmers adjust their feed rations according to relative cost of the various feeds and supplements, thus assuring that balanced rations in effect are at minimum cost.

⁹ See, for example, *Kommunist*, No. 11, 1982, p. 6.

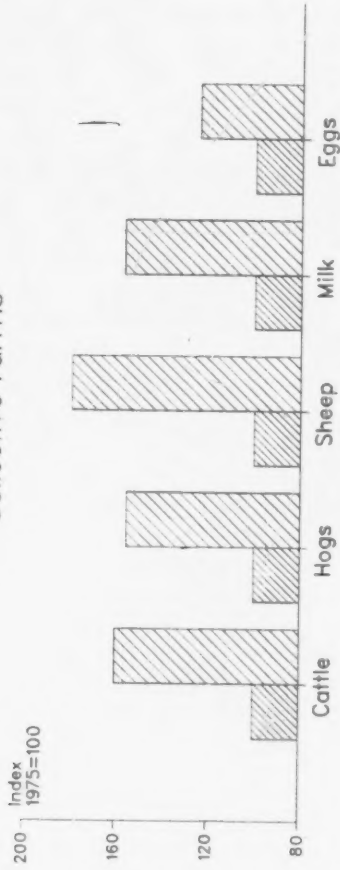
¹⁰ The emphasis on increased feeding of concentrates led to more than doubling in quantities of grain fed since 1965. In the face of lagging grain output, central planners until a few years ago did not emphasize the production of other feed crops sufficiently to meet the growing demand for feed. Consequently, Moscow resorted to imports of grain to make up part of the shortfall in needed energy. Grain is widely traded, easily transported, and to an extent can be substituted for other types of feed in many feed rations. Roughly 55 percent of total available grain (production and imports) is now used as livestock feed. Clearly, the USSR's long time goal of agricultural self-sufficiency in combination with improvement in the diet has taken second place to that of producing ever larger quantities of meat.

stantially since 1975, in part because of the increasing cost of feed (particularly of concentrates) which makes up roughly 50 percent of the cost of production (figure 1). In addition, Soviet agricultural researchers note that because most of the growth in production of livestock products has been achieved by increases in numbers of animals, substantial additional expenditures for buildings, for operation of facilities, and for labor, have contributed to the escalation of production costs.¹¹

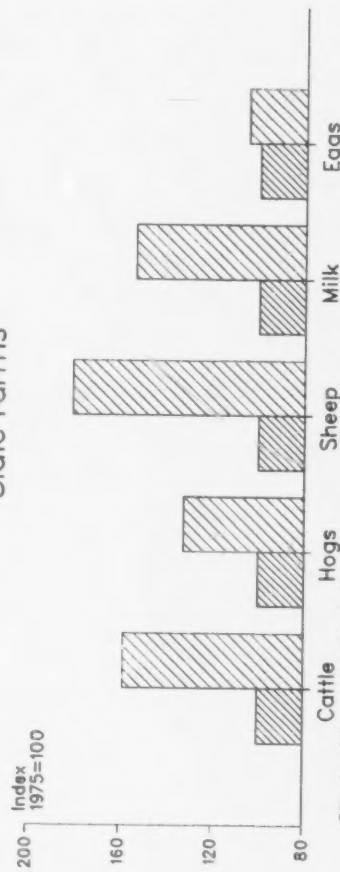
¹¹ *Vestnik sel'skokhozyaystvennoy nauki*, No. 5, 1983, p. 51.

Dec 17, 1986

Figure 1
USSR: Growth in Farm Production Costs
Collective Farms



State Farms



Legend
 1975
 1976
 1977

^aDerived from Soviet statistics on the ruble cost of producing one ton of live-weight gain, one ton of milk, and 1000 eggs. Narodnoye khozyaystvo v SSSR v 1975 godu, pp.417,437, and Narkhoz 1985, pp. 281,292.

A. FEED PRODUCTION LAGS

Even with large imports of grain and other feedstuffs per animal, the average feed ration in the early 1980s was still nearly 20 percent below announced Soviet standards.¹² The Soviets may have overshot their mark by focusing on expanding the use of grain in feed rations. Such increases did not result in corresponding increases in average animal productivity because of the continued shortage of energy and inefficiency of rations in terms of balance.¹³ For example, during 1971-80 the use of grain for milk production rose by 17 percent, or nearly twice as fast as milk output; the use of grain for cattle feeding increased by 35 percent, while beef production grew by only 22 percent.¹⁴ The share of concentrates is now about 33 percent in the Soviets' overall livestock feed supply—close to the share in the US supply, which has ranged from 34 to 41 percent since 1975.¹⁵ However, the herd structure in the USSR differs markedly from that in the United States (figure 2). A simplified calculation indicates that if cows, other cattle, hogs, and poultry in the USSR were fed the same concentrate-roughage balance as their US counterparts, concentrates would account for only 25 percent of the total—a reduction in their use from the 142-million-ton average fed during 1980-83 to 110 million tons.

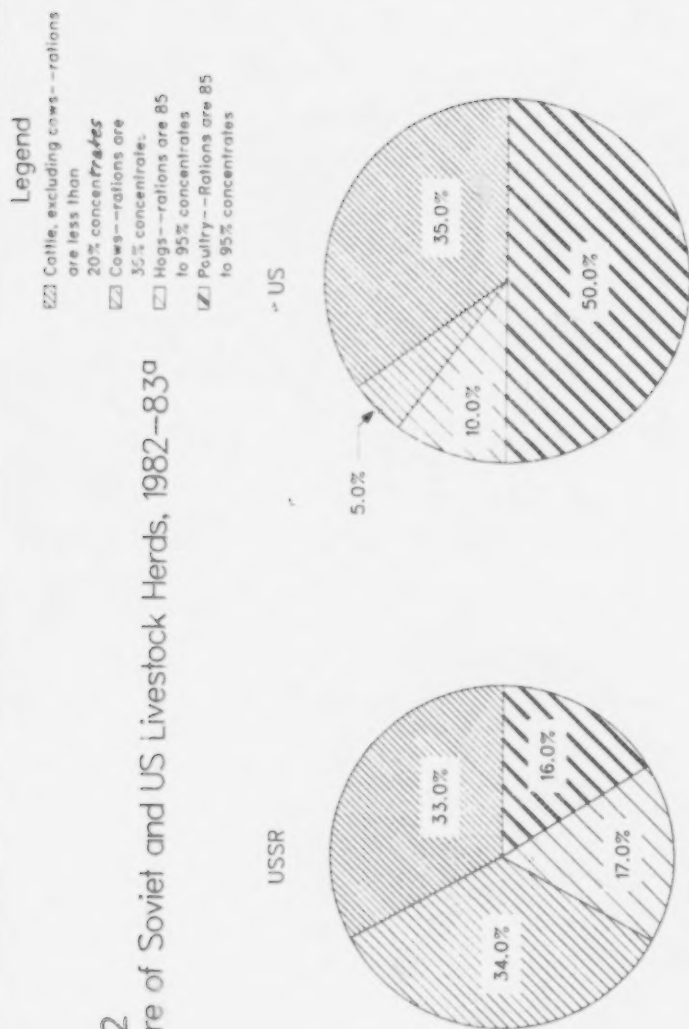
¹² During the 5-year period of 1979-83, imports of nongrain feedstuffs averaged nearly \$675 million per year and totalled over 7 million tons of soybeans, almost 3 million tons of soybean meal, 0.75 million tons of mixed feed, and 0.50 million tons of manioc. Combined with average annual grain imports of 35 million tons during the same period, feedstuff imports effectively constituted about one quarter of total concentrates fed.

¹³ Productivity gains from the proliferation of large-scale specialized livestock production facilities, which improve feeding efficiency by as much as 50 percent according to Soviet agricultural specialists, were largely offset by lower efficiency in the remainder of the livestock economy, which suffered shortages of important feed supplements because the specialized facilities were given priority.

¹⁴ *Kormoproizvodstvo*, No. 9, 1983, p. 5 and *Narodnoye khozyaystvo v SSSR v 1980 g.*, p. 247, hereafter *Narkhoz* and the year.

¹⁵ *Narkhoz 85*, p. 251. *Planovoye khozyaystvo*, No. 4, 1981, p. 97 indicates that, on average, the nutrient content of one unit of concentrates is slightly less than one feed unit. The USSR defines one kilogram of feed units as containing the nutrient value of 1 kilogram of oats.

Figure 2
Structure of Soviet and US Livestock Herds, 1982-83^a



^aTotal numbers of cows, cattle (excluding cows), hogs, and poultry (including broilers) for each country are weighted by relative Soviet feed requirements per type of animal to derive share of total herds. Sheep and goats are not included in the calculations because they are primarily forage consumers. These animals account for nearly 10% of Soviet herds but less than 1% of US herds.

Perhaps recognizing that the steady increases in feeding of concentrates was not helping to achieve livestock targets, Soviet leaders in recent years have stressed the importance of feeding forage crops and even of reducing quantities of concentrates fed. At the July 1978 agricultural plenum Brezhnev, then General Secretary, highlighted the need to improve the quality and quantity of forage crops. But the several decrees that followed had little effect.

Not until the Food Program mandated increased quantities of chemical fertilizer and additional investment in machinery and storage facilities for roughages did the priority given by farms to production of these key crops appear to change. Aided by favorable weather in both 1982 and 1983, production of the more important roughage crops, corn for the silage and green feed, feed roots, and hays reached record levels. With the exception of perennial and natural hays—which declined slightly in 1984—output of all these crops continued to increase steadily through 1985.

According to the Soviet agricultural press, farm managers are well aware of the improved animal productivity that can be achieved by feeding better balanced livestock rations. At the same time, Gorbachev's continued complaints about foot-dragging suggest he feels that forage production is still not stressed sufficiently.

B. IMPROVING THE PROTEIN CONTENT

Although the USSR has recently made progress in achieving larger per head feed rations and a better balance between concentrates and roughages, headway in improving protein content has been slow.¹⁶ Although the reduction in amount of feed required and length of the period needed to bring animals to market weight resulting from the improvement cannot be quantified, movement in the direction of improved efficiency is clear.

Western observers have long urged the USSR to import soybeans and soybean meal as a "simple and quick" solution to the protein deficit.¹⁷ Moscow, however, refused to do so until the end of the seventies perhaps because the mixed-feed industry did not have adequate mixing facilities and trained workers to process the meal efficiently. Moreover, shipping and handling losses could be substantial. The sharp reduction in soybean meal imports from 2.3 million tons in 1983 to an average of less than 150 thousand tons annually during 1984-85 indicates Moscow's earlier reluctance to import large quantities was well founded. Major domestic sources of high-protein feeds—those containing 20 percent or more of their weight as crude (total) protein—include non-protein nitrogen (which converts to protein in the digestive process), oilseed meals, animal products such as meat and bonemeal, and single-cell protein.¹⁸ Less concentrated but valuable sources of protein include milk and crops such as pulses, alfalfa, and clover.

¹⁶ According to *Ekonomika sel'skogo khozyaystva*, No. 2, 1981, p. 61, feed rations in 1980 were roughly 15 percent short of the quantity of protein needed for fully balanced rations. By 1984, *Kormoproizvodstvo*, No. 11, 1984, p. 37, reported that in most areas of the country the protein content was up to 100 grams per feed unit, about 10 percent short.

¹⁷ D. Gale Johnson, *The Soviet Impact on World Grain Trade*, British-North American Committee, USA, May 1977, pp. 12-19.

¹⁸ Crude protein refers to all the nitrogenous compounds in feed; digestible protein refers to protein utilized by the animal and is estimated by coefficients derived over time from feeding

Continued

The USSR lacks the agronomic conditions to produce large quantities of soybeans; production averages about 500 thousand tons annually compared with an annual average US crop of over 50 million tons during the 1981-85 period. Substantial amounts of other oilseed meals (particularly sunflower and cottonseed) are produced, but the quantity is far less than needed to fully alleviate the protein deficit.

To increase domestic supplies of high-protein feed, the USSR over two decades ago chose to develop the single-cell protein (SCP) industry. Although both startup and operational costs are high for this specialized product, the long-run gains for the USSR, with its aversion to becoming dependent on the West, are substantial:

- Production is independent of the weather.
- Protein content of feed rations is increased with no dependence on foreign suppliers.
- The product is handled and stored with little difficulty and can be easily incorporated into feeds.
- Finally, there is an increasing body of test results in the United States indicating that the payoff in improved efficiency per gram of protein from SCP is higher than that from oilseed meals.¹⁹ Experimental work has not yet been able to explain this phenomenon.

Today, the USSR is by far the world's largest producer of SCP. By 1985 output had reached nearly 1.5 million tons, and SCP supplied nearly one-quarter of the protein available from high-protein feeds.²⁰ In contrast, only comparatively small amounts of SCP are produced in the West, because the cost of production is at least double that of soybean meal, making it uneconomic for Western feeding operations. There also are widespread fears of the possible carcinogenic properties of SCP produced from hydrocarbon substrates. Soviet specialists argue these fears are baseless.

III. PLANS TO INCREASE AND IMPROVE FEED SUPPLIES

A. GROWTH IN PRODUCTION

The Food Program called for increasing the supply of feed to 540-550 million tons of feed units by 1990. Achieving even the lower end of the target is unlikely. Feed use during the 1981-85 period averaged nearly 420 million tons of feed units annually.

As of late 1986 this goal was still being repeated. Current feed conversion ratios, however, indicate that somewhat less than 500 million tons of feed units would be sufficient to produce the livestock products and support the herd growth targeted for 1990. In part, fewer feed units are needed because targets for meat and egg production were revised slightly downward when the 12th Five-

trials. *Single-cell protein* in a collective term including protein-rich microorganisms such as bacteria, algae, and fungi (yeast and molds) grown on byproducts of oil, on methanol, or on organic wastes from agriculture and industry.

¹⁹ See, for example, Slagle, Stephen P. and Zimmerman, Dean R. "Evaluation of a Yeast Single-Cell Protein with Young Pigs," Journal Paper No. J-9465 of the Iowa Agriculture and Home Economics Experiment Station, Ames, Iowa, Project No. 2021.

²⁰ Soviet sources indicate that only a negligible amount of SCP is being used experimentally to develop foods suitable for human consumption.

Year Plan was presented in November, 1985.²¹ Alternatively, the Soviets may not attempt to rigorously follow an integrated plan. In a recent television interview, a leading academician of the Academy of Agricultural Sciences said: "We have not had balanced plans for years," and added that the plan is used primarily to exert pressure on managers.²²

Although the Soviets will have mixed success in carrying out their ambitious plans for increasing the availability of feed, the experience of the first half of the 1980s suggests that livestock production targets will be met. Indeed, it now appears highly likely that sizable quantities of foreign grain will not be needed to supplement feed supplies later in the decade. Initiatives in the livestock sector over the past few years appear to have halted the rapid expansion of grain feeding that characterized the 1970s. In addition, Moscow also seems to be reducing the amount of grain required for other uses:

- The anti-alcohol campaign, begun in 1985, and concomitant reduction in alcohol production could trim overall grain needs by as much as 1 million tons.
- Increases in the availability of other foods over the past few years have reduced total consumption of grain products such as bread and cereals.
- The reduction in area sown to grain, begun in 1978, in favor of fallow has resulted in a 2-million-ton decline in the use of grain for seed.

The protein content of feed rations will improve but will still be 5 to 8 percent short of the Soviet norm. Milk, meat and bone meal, and fish meal will continue to be major sources of high-protein supplements, but availability of protein from domestically produced oilseeds, other high-protein crops such as pulses and SCP will fall well below plan. A more detailed review of each of these feed categories is presented below.

1. Concentrates

The share of concentrates in total feed used dropped from 36 percent in 1980 to 35 percent in 1982 and to just 34 percent in 1985. This is close to the 33-percent share scheduled for 1985.²³

If area sown to grain remains constant, weather patterns approximate the 1960–85 average, and the long-term trend in fertilizer deliveries to agriculture (an established surrogate for technological advance) continue, grain output is likely to average around 200 million tons during the 1986–90 period, reaching nearly 210 million

²¹ There may be other reasons for the discrepancy. Perhaps the plans for feed production are not derived from planned product output but from plans for herd growth and normed quantities of feed per animal; perhaps feed production plans and feed consumption plans are not checked for consistency, particularly those for the private sector (which still produces about 30 percent of total meat, milk, and eggs); perhaps the current reported feed conversion ratios do not represent real averages but a better-than-normal situation. (Soviet animals are still largely marketed at lower weight than most Western animals and gain weight slowly, although, according to Soviet textbooks, weight is one of the criteria used in planning feed needs.) Finally, it is unlikely that feed for livestock not included in the calculation—camels, oxen, buffalo, mules, and reindeer—accounts for much of the difference. On 1 January 1971, the most recent data available, there were fewer than 4 million such animals, and well over half of these were reindeer. This compares with 7.5 million horses and almost 100 million cattle on the same date.

²² FBIS Daily Report, *USSR National Affairs*, 9 September 1985, p. T4.

²³ G. P. Rudenko, *Razvitiye agropromyshlennogo kompleksa v odinadsatoy pyatiletke*, Moscow, 1982, p. 44.

tons in 1990.²⁴ This compares with average annual production of 180 million tons during the 1981-85 period and 192 million tons in 1985. To the extent that the "intensive technology" campaign raises average yields, production will be even higher.²⁵ In 1985, Gorbachev credited the program with adding 16 million tons to Soviet grain output. The figure probably does not take into account offsetting production declines in areas from which resources were pulled. Even in the absence of improvements in feeding efficiency or adjustment to differing needs for concentrates among different classes of animals, grain imports associated with the 1990 crop thus are likely to be far smaller than the roughly 30 million tons of imports associated with the 1985 crop.²⁶

2. Roughages

These feeds make up roughly two-thirds of the energy consumed by livestock currently, up several percentage points from the average of the 1970s. Throughout the 1970s, growth in producing and feeding of roughages was slow. These crops were slighted in allocation of yield-enhancing fertilizers and pesticides, and suffered from a lack of specialized equipment for harvesting. The Food Program's emphasis on increased supplies of fertilizer and equipment, combined with slowly expanding storage facilities for harvested forage crops—hay, haylage, silage, and grassmeal—has had a positive effect. Yields of corn for silage and green feed during the 1982-85 period were 16 percent above those of the 1976-80 period. Similarly, average yields of perennial hay were up by one-third; of annual hay and feed roots, by 11 percent. Even yields of natural hay, about one-third of total hay, were up by 5 percent. Roughage procurement data suggest that another bumper crops was produced in 1986.²⁷

One part of roughage production continues to be neglected—pasture. In the USSR, pastures occupy well over 300 million hectares—roughly half the total agricultural land—and reportedly provide about 20 percent of animal feed (nutrient value).²⁸ Soviet

²⁴ Based on average yield and time regression.

²⁵ "Intensive technology" as defined by the USSR includes many farm-management practices routinely done in the West—use of high-yield varieties, planting after fallow, and greater use of agrochemicals. The program covered 17 million hectares in 1985 and is slated to expand to 50 million hectares by 1990.

²⁶ Any estimate of feed requirements is sensitive to assumptions about feeding efficiency—the quantity of feed required per unit of output. In view of the relatively stable feed conversion ratios in the USSR since 1970, the conversion coefficients are likely to remain close to current levels for the balance of the decade unless plans to increase supplies of domestically produced high-protein feeds are at least partially achieved. If, however, feed conversion ratios for each type of meat, for eggs, and for milk were to improve by 0.5 percent per year over the five-year period, the decreased need for feed would reduce the requirement for grain by some 10 million tons in 1990. A 0.5 percent annual improvement is roughly the rate achieved by several West European countries in production of pork and eggs over the first half of the 1970s. Although the West European countries were generally at higher levels of feeding efficiency in 1970 than are currently observed in the USSR, many of their practices—such as the ways in which roughages were stored—were similar to present Soviet operation.

While there is much room for improvement in feeding efficiency, some of the gains anticipated from, say, increased protein in the feed ration could be offset by failure to improve other factors that have been affecting feed quality. For example, given past practice, upgrading and expansion of storage facilities sufficiently to preserve nutritional content of increasing quantities of harvested roughages is unlikely.

²⁷ *Pravda*, 9 October 1986, reported that with 93 percent of the crop in, the forage harvest in terms of feed units was running 5 percent ahead of the record 1983 pace.

²⁸ Official statistics on feed from pasture must be used with caution because, according to Soviet textbooks, they are partly approximated and may overstate or understate true quantities used.

agricultural specialists have long noted that little chemical fertilizer is used on pasture, that manure is applied at half the recommended rates, and that the large sums devoted to providing water for pasture have had only limited results.²⁹ Indeed, lack of attention to pasture in the desert and semiarid parts of the country—about two-thirds of the total pasture area—has caused serious declines in feed quality and yields, slowing growth of mutton and beef production. In 1983, one-third of Kirghizia's natural pasture was "covered" with harmful grasses that livestock would not eat.³⁰ Soviet farm managers are likely to be slower to change pasture management than they have been in recognizing the need to increase supplies of harvested roughages. According to a former USSR Minister of Agriculture, there is "widespread opinion that pasturing of livestock has lost its importance now that animal husbandry is being conducted on a more industrialized basis."³¹

The supply of roughages will continue to increase, although not sufficiently to reach planned feed-unit production targets. As in the past, several factors militate against meeting plan:

- Planned fertilizer deliveries are not yet sufficient to raise yields to meet output goals.
- Yield increases from land improvement (irrigation and drainage) are slow in coming.
- Specialized equipment for harvesting continues in short supply.
- Storage facilities are woefully insufficient even for current production levels.

A continued slow improvement in supplies of crucial inputs is probable, suggesting growth in yields of harvested roughages of about 2 percent annually, somewhat less than the unusually high average of 3.1 percent achieved during the 1982-85 period, but above the 1.1 percent average registered during the 1971-85 period.³² Quantities of feed from pastures—which will probably continue to be the residual claimant for fertilizer, seed, pesticides, irrigation equipment, and water supply—probably will be relatively unchanged.

B. REDUCING THE PROTEIN SHORTAGE

An obvious short-term solution to the Soviets' livestock-feed protein shortage is imported soybean meal; however, very large quantities would be required. Such imports would be expensive—for example, 10 million tons at mid-1984 prices would cost about \$1.7 billion, an annual cost that Moscow could expect to repeat indefinitely—and would confront the mixed-feed industry with the technical difficulties inherent in incorporating the meal into feed rations. As noted above, problems with handling, solidification during storage, and high "shrinkage" (losses) reportedly caused Moscow to draw

²⁹ See, for example, *Sel'skoye khozyaystvo Rossii*, No. 6, 1985, p. 24.

³⁰ *Kommunist Kirghiziya*, No. 4, 1983, p. 78.

³¹ *Kormoproizvodstvo*, No. 9, 1983, p. 4.

³² Yields of corn for silage and green feed, of annual, perennial, and wild hays, and of potatoes weighted by their respective 1969-71 annual average production and 1970 average realized prices. For an explanation of the construction of a crop yield index see Douglas Diamond and Lee Davis, "Comparative Growth in Output and Productivity in U.S. and USSR Agriculture," in Joint Economic Committee, *Soviet Economy in a Time of Change*, Washington, D.C., 1979, p. 34.

back sharply in 1984 and 1985 from the 2.3-million-ton level posted by soybean meal imports in 1983. High-level Soviet officials continue to state, moreover, that the USSR does not want to become dependent on soy imports.

Moscow plans to increase the protein content of animal rations in the longer term through three major domestic production efforts: oilseed meals; other crops that have a comparatively high-protein content, such as pulses, alfalfa, and clover; and single-cell protein. Plans for production of all three groups are ambitious, and goals appear to be beyond reach. Moreover, substantial increases in the supply of animal-based protein feeds are not likely. Use of whole milk and milk-processing byproducts such as whey for livestock feed are inefficient and uneconomical and must be reduced according to Soviet officials.³³ In contrast, if plans to supply the meat-processing industry with updated and complex equipment for processing byproducts are carried out, output of meat meal and bone meal could be increased by at least one-quarter, adding the equivalent of a few thousand tons of soybean meal as meat production continues to increase.

1. Oilseed meals

The area sown to oilseed crops—sunflowers, cotton, soy, rape, and so on has been fairly constant, averaging 10 million hectares annually during the 1979–85 period. Yields, however, on average have shown little change during this period. The sunflower and cotton crops supply seed for roughly 85 percent of oilseed meal produced from domestic resources.

Production of sunflower seed averaged 5.0 million tons during 1981–85—well below the nearly 6-million-ton crops of the early 1970s and even further below plans to produce an average of 6.7 million tons during the 1981–85 period. Persistent hopes to improve sunflower yields have been thwarted by a lack of high-yielding and disease-resistant hybrid seeds; weather difficulties (particularly drought during periods crucial to growth); and increasingly frequent outbreaks of disease (mold and mildew), which are possibly the result of incorrect crop-rotation practices. For these reasons, plans to produce 7.2–7.5 million tons of sunflower seed annually during the 1986–90 period appear to be too optimistic.

Cotton production during 1981–84 averaged 9.1 million tons, close to the 1981–85 plan for 9.2 million tons annually. Although currently available at roughly the planned level, cottonseed is not so desirable a source of oilseed meal as sunflower seed because it is low in lysine and several other important elements. It also contains the substance gossypol, which is toxic to nonruminant animals such as hogs and which causes mottling of egg yolks if fed to laying hens.

Soybean production continues to disappoint Soviet agricultural planners. Agroclimatic conditions are generally unsuitable; where production is possible, yields are less than one-third US yields. Moreover, incentives for soybean production are lacking. Plans to produce 2.2–2.3 million tons annually during the 1986–90 period

³³ *Voprosi ekonomiki*, No. 5, 1986, pp. 95–97.

appear based on unrealistic expectations; production averaged roughly 500,000 tons annually during the 1981-85 period.

The USSR has usually used rape, which provides excellent forage, for grazing and green feed; it has used both the spring crop and an unreported but probably large area of the winter crop for these purposes. Soviet plans call for output of rapeseed to increase to 1.5 million tons in 1990. This goal, too, appears to be overly ambitious; rapeseed production (spring and winter) equalled only 74 thousand tons in 1985.³⁴ Rapeseed meal seems unlikely to add large quantities of protein to animal rations through the 1980s.

2. Pulses and other high-protein crops

As part of the plan to increase production of pulses, the area sown to these valuable feed crops increased by more than one-third, to 6.5 million hectares, from 1980 to 1985. Much of the increased area was in the Ukraine, where yields have run as much as 50 to 80 percent higher than the country-wide average. Larger plantings in higher yielding areas combined with good moisture to raise average yields to 14.4 quintals in 1985, only 3 percent short of the record yield achieved in 1970. Nonetheless, to meet the 1990 production target of 18-20 million tons, a yield increase of 20 to 30 percent over the 1985 level would be needed, even if area devoted to pulses reaches the previous record (10.8 million hectares in 1963). Yields will, however, remain relatively unchanged, because chronic difficulties in seed selection and in maintaining seed purity are not likely to be overcome soon.

Similarly, longer-range plans to raise the alfalfa area to 10 million hectares and the clover area to 8-9 million hectares by 1990 (from 6.8 and 6.2 million hectares, respectively, at present) are not likely to be met.³⁵ Another, perhaps key, factor slowing expansion of these crops is the limited development of high-yielding and disease and pest-resistant varieties. Until recently, shortages of good quality seed also hindered progress. The establishment of specialized seed producing farms in the past few years, however, apparently has been beneficial. In December 1984, TASS reported that collective and state farms' needs for alfalfa seed will "now be basically satisfied."³⁶

3. Single-cell protein

Production of single-cell protein reached 1.5 million tons in 1985—nearly 60 percent more than the 1980 level. No plans for 1990 have been published. The numerous chronic shortages of raw materials (particularly of paraffins) for growing SCP, the slowness in commissioning new capacity, and "acute problems in using available capacity" suggest that production growth is not likely to continue at that rate.

³⁴ *Vestnik statistiki*, No. 10, 1986, p. 76.

³⁵ *Kormoproizvodstvo*, No. 9, 1983, p. 2. Alfalfa was planted on 8.2 million hectares in 1984. *Kormoproizvodstvo*, no. 11, 1985, p. 2.

³⁶ FBIS Daily Report, *USSR National Affairs*, 17 December 1984, p. T2. This is noteworthy—if true. On 15 January 1984 *Sel'skaya zhizn*, the central agricultural organ, had reported that the majority of farms producing seed failed to meet plans for selling seed to the state. The article did not quantify the extent of the shortfall.

Although SCP is not a panacea for the protein deficit in livestock feed, it will contribute to raising the protein content of feed rations toward the established target. For many years to come, however, the availability of domestically produced oilseed meals and animal products (particularly milk and skim milk) will be more important determinants of the overall protein content of the feed supply.

IV. OUTLOOK

A. GAINS IN FEED AVAILABILITY

The Food Program's emphasis on expanding production of forage crops and increasing meat output has not yet had a marked effect on productivity, that is, on the changing relationship between inputs of feed units and output of meat, milk, or eggs. When examined in quantitative terms by comparing aggregated livestock output with the appropriately weighted quantities of feed required to produce it, productivity increased by only 1.7 percent over the 1981-85 period.³⁷ Since 1980, feed conversion ratios (state and collective farms only) for milk and beef have gone up slightly, and those for pork have gone down.³⁸

Nonetheless, because programs of the past few years have increased domestic supplies of feed (although to only a limited degree per animal so far—5.5 percent from 1982 to 1985), substantial progress toward achieving meat production goals may well occur. Indeed, if paired with good weather, these programs are likely to substantially reduce the demand for imported grain. Because the development of the farm sector to 1990 will depend strongly on weather and on how Gorbachev carries out his stated intentions, projecting grain import needs is an uncertain exercise at best.

A conservative scenario for livestock feed availability by 1990 suggests the USSR would have enough feed units to meet the 1990 meat, milk, and egg production goals and to support planned herd growth if:

- Grain production increases at the 3-million-ton per year rate suggested by 1960-85 average weather patterns and the trend in fertilizer delivery to agriculture.
- The supply of harvested roughages increases about 2 percent a year, somewhat slower than the 3-percent growth achieved during 1982-85 but above the long-term rate.
- Current feed-conversion ratios are unchanged.
- Grain imports equal roughly 20 million tons in 1990.

Because herds are planned to grow only slowly and farm managers will adhere to this plan, this scenario implies a substantial gain in feed per animal and a slowdown in the rapid rise in production costs noted since 1975.³⁹ Moreover, the share of concentrates would

³⁷ In terms of value of livestock output per feed energy unit required to produce it, in 1970 average realized prices. The figure thus includes shifts in the mix of livestock product.

³⁸ *Vestnik statistiki*, No. 10, 1981, p. 75, and *V.S.*, No. 10, 1986, p. 80.

³⁹ Gorbachev has consistently argued the need to improve animal productivity, and planners appear to be incorporating this conviction into their plans. For example, three-quarters of the gain in milk output during the 1980s is scheduled to come from increasing milk yield per cow. (Ya. P. Ryabov, *Sotsial'no ekonomicheskoye razvitiye SSSR v odinadtsatoy pyatiletke*, Moscow, 1981, p. 43.) Progress is being made. According to the Summary of World Broadcasts, "Now that farms have been given greater independence, they are slaughtering low-productivity animals." SWB, 14 February 1986, SU/W1377/A/6.

be down slightly, suggesting a further, albeit slight, improvement in achieving a concentrate-roughage-herd balance similar to that which exists in the United States. If, in addition, plans for domestic production of high-protein supplements are partially achieved, the protein content will also increase. Achieving half the planned increases would, for example, raise protein content roughly 3 percent.

As a consequence, the more suitable concentrate-roughage balance and increased protein content should lead to improved efficiency. If herd growth is kept to the planned rate, the shortage of energy per animal would be cut in half, to about 10 percent. The increased protein content would also improve utilization of the available feed. As a result, producing the targeted quantities of livestock product would probably require grain imports of somewhat less than 20 million tons. Although the reduction in need for imported grain cannot be estimated precisely, it could be as much as 5 million tons. At the same time, much of the gain from increased protein content may well be offset by other factors such as the lack of adequate storage facilities for maintaining high-quality harvested roughages through the winter months.

B. GAINS FOR THE CONSUMER

Achieving the 1990 meat-output goal of 21.0 million tons would mean almost a 20-percent gain in production per capita from 1985, an average of about 3 percent annually.⁴⁰ Per capita meat availability, however, would grow less rapidly—2 percent annually—unless Moscow continues to import meat at the record near-million-ton level of recent years. Even this lower rate of growth far exceeds the average 0.6 percent growth in availability achieved since 1975 and would help reduce shortages and queuing for meat. The leadership, in turn, would benefit from having proven its ability to successfully implement a program based on improving levels of living.

C. MORE FAVORABLE THAN EARLIER ESTIMATES

This more favorable outlook for the USSR is based largely on the excellent roughage outturns of the past few years.⁴¹ Continuing the roughage expansion will require steady yield increases, a continuation of the current government policy that allocates resources toward their production, and continuation of current incentives for farms to produce roughages.⁴²

D. BUT OTHER OUTCOMES ARE POSSIBLE

Unusually good weather throughout the balance of the 1980s would, for example, allow increases in production of all crops. Very good weather and the meeting of planned targets for intensive

⁴⁰ This goal represents a reduction from the 21.7 million tons announced in the Food Program, but is still sufficient to cover the per capita consumption goal.

⁴¹ See, for example, the several articles discussing Soviet agriculture in Joint Economic Committee, *Soviet Economy in the 1980's: Problems and Prospects*, Part 2, Washington, D.C., December 1982.

⁴² The overall area devoted to roughages cannot be expanded substantially except at the cost of other crops, although limited gains can be achieved through shifting crop patterns. These conditions suggest a 2-percent annual increase in production of roughages is likely.

technology would increase grain production substantially. If, in addition, Moscow continues to emphasize the necessity to produce roughages and to increasingly direct resources toward that end, roughage output plans—as well as those for adequate harvesting and storage of these crops—could be met. As a result, more than enough feed would be available to produce—at present feed-conversion ratios—planned output of meat, milk, and eggs. Gains in efficiency arising from ample supplies and better balance of feed per animal would ultimately make more grain available for alternative uses such as stockbuilding and possibly export. It is unlikely that Moscow would use this dividend to further stimulate meat and milk production in the next five years; processing and handling even the planned quantities of meat and milk may strain the system.

In another alternative, unfavorable weather—say conditions approximating those of 1961–65 with precipitation equal to the lowest five-year average of the 1961–85 period—would cut grain production substantially. Growth in yields of roughages would probably be even slower than the 1 percent averaged during 1971–85. Although the chance of a repeat of 1961–65 average precipitation is estimated to be less than 1 in 20, such an outcome would raise the need for grain imports to levels even higher than the 40-million-ton average of 1981–85. Purchases of such magnitude would have a welcome upward effect on depressed world grain prices, but would also increase the USSR's hard currency burden.

As in the past, the consumer would bear the brunt of the adjustment. Growth in per capita production of meat would be noticeably slower than planned growth of disposable money income, and the current gap between supply of and demand for meat would widen. Measures to cope with the situation and curb consumer discontent might include providing large quantities of other desired goods to reduce the demand for meat, expanding even further the specialized food distribution networks, and increasing meat imports substantially above the nearly 1-million-ton average of the early 1980's. The last alternative would not necessarily add substantially to hard-currency spending because only one-third of the meat now imported is from hard-currency trading partners.

SOVIET AGRICULTURAL TRANSPORT: BOTTLENECKS TO CONTINUE

By Judith Flynn and Barbara Severin*

CONTENTS

	Page
Summary	62
I. The agricultural burden on transportation—large and increasing	63
II. The cost of inadequate transport facilities	66
III. The main problems	67
A. Inadequate roads	67
B. Shortages of transport equipment	68
C. Inefficient use of trucks and fuels	69
IV. Coping with the problems	70
A. The official line	70
B. Policies in practice	70
1. Top priority to expediting grain imports	70
2. Solving problems for the railroads	71
3. Some retrenchment on the truck issue	73
4. Roads—still a huge problem	74
V. Outlook	75

APPENDICES

A. Transportation players	76
B. Product losses	77

TABLE

1. USSR: Transport volumes, total and agricultural, 1983	64
--	----

SUMMARY

Soviet agricultural losses are likely to remain large for the foreseeable future on the basis of the poor quality of rural transportation facilities and inadequate investment resources to improve them. Moscow's current policies are not sufficient to solve the agricultural transportation problem—particularly on or near the farm—in the 1980s or probably the 1990s. Nevertheless, Gorbachev is at least starting the process of change. For example, the moderate but serious effort to expand rural roadbuilding and greater efforts to improve trucking and railroad service will provide a stronger foundation for increases in food supplies in the coming years.

Although the agricultural sector—both on the farm and off—has received a large share of transport resources in the past, growth in transport capacity has failed to keep pace with agriculture's increasing demands. Transport carriers are already struggling to ship

* Office of Soviet Analysis, Central Intelligence Agency.

the growing volumes of industrial materials necessary for modern and efficient agricultural production, and Gorbachev's 1986-90 Plan promises farms substantially larger quantities of agrochemicals, equipment, and other needed production resources.

Even if all these resources reach the fields and output is increased, the large losses caused by inadequate transportation and storage—some 20 percent of agricultural output—could prevent substantially larger quantities of farm products from reaching the consumer's table.

Agricultural transport losses result in large part from the insufficient quantity and poor quality of rural roads and poor vehicle servicing capabilities in rural area. More generally, these problems reflect chronic central problems of poor work incentives and inadequate investment in rural infrastructure. Although Gorbachev is committed to increasing investment in rural infrastructure, the overall needs are so vast that, from the transport perspective alone, only slow progress is likely. Probably tens of billions of rubles ultimately will be necessary to make real headway. Rural areas are not in a position to finance this kind of investment themselves, and the Kremlin is unlikely to take on such a major task with investment funds already earmarked for high-priority takers in machine building and energy.

In addition to an inadequate system of roads, agriculture has only about half the number of trucks Soviet planners feel are required. Nonetheless, the sector already controls about one-fifth of the national truck fleet and commands even more during the heavy harvest season—including some of the military's. Moreover, high turnover of the truck stock—partly because of poor roads and limited servicing—leads to demand for an even larger share of current deliveries and intense competition with other users for new trucks.

I. THE AGRICULTURAL BURDEN ON TRANSPORTATION—LARGE AND INCREASING

Since the mid-1960s agriculture's high priority has resulted in a preferential claim on transport resources. Brezhnev's decision soon after he came to power in late 1964 to bolster agriculture's priority for investment and material resources set the stage for a large and growing demand for transportation services that has resulted in a major drain on the nation's transport resources—particularly on vehicles and fuels.¹ Rising deliveries of machinery and agrochemi-

¹ The productivity of added transport resources dedicated to agriculture has been low. Rail and highway shipments for the so-called agroindustrial complex (including shipments to as well as from agriculture) increased by about 120 percent and 160 percent, respectively, between 1965 and 1985. In contrast, farm output (net of feed, seed, and waste) increased by only 35 percent during the same period—and high-priority grain output by only about 70 percent. Data for rail are derived from the sum of shipments for grain and fertilizer (reported in *Narodnoye khozyaystvo v SSSR v 1985 g.*, Moscow: 1986, hereafter *Narkhoz* and the relevant year) and for other freight (using the share of such freight in 1983 derived from total shipments reported in *Plannovoye khozyaystvo*, No. 12, December 1983, pp. 72-78 less grain and fertilizer shipments.) Data for highway shipments are reported in *Ekonomicheskaya gazeta*, No. 33, August 1982, p. 1 and M.S. Khodosh, *Gruzovyye avtomobil'nyye perevozki*, Moscow, Transport, 1986, p. 6. The methodology and data used in calculating net farm output is described in JEC, *USSR: Measures of Economic Growth and Development, 1950-80*, USGPO, Washington: 1982, pp. 245-316. Post-1980 data are largely from *Narkhoz 1982* and subsequent annual editions. The price weights have been changed from 1970 to 1982. See L. Kurtzweg, "Trends in Soviet Economic Performance," in this volume.

cals over the last two decades, often from distant industrial producers, pushed up the need for long-distance hauling by rail, and increasing application of chemical fertilizers and pesticides on the farm added to the demand for trucks. For example, deliveries of chemical fertilizer to agriculture quadrupled from 1965 to 1985, while the use per hectare of land sown to grain rose by roughly seven times.² Gains in farm output have also added to the burden on transportation, albeit much less rapidly than deliveries of industrial materials to the farms.³

Agricultural shipping now accounts for about 10 percent of all rail shipments (tons originated) and 16 percent of rail traffic (ton-kilometers) nationally (see table 1). For highways, the figures are even larger. Every fourth ton of freight shipped on the highways is for the agro-industrial complex, and one-third of all highway traffic is agricultural.

TABLE 1.—USSR: TRANSPORT VOLUMES, TOTAL AND AGRICULTURAL, 1983¹

	Total	Railroad	Highway	River	Maritime
Traffic (billion ton-km).....	5,251	3,600	486	273	892
Of which: Agriculture.....	868	580	171	12	120
Shipments (million tons).....	31,121	3,851	26,425	607	238
Of which: Agriculture.....	7,144	376	6,700	38	30
Materials.....	NA	176	4,000	30	NA
Of which: Fertilizer.....	NA	138	NA	NA	28
Products ³	NA	200	2,700	8	NA
Of which: Grain.....	NA	135	NA	7	20

¹ Derived from "Narodnoye khozyaystvo SSSR v 1984", pp. 335, 338, 342, and various Soviet publications such as "Izvestiya Timiryazevskoy sel'skokhozyaystvennoy akademii", No. 4, 1985, p. 5.

² Includes other agricultural chemicals.

³ Farm production in the USSR averages roughly one billion tons annually. Many of these products, particularly feedstuffs, are moved at least twice, substantially raising the tonnage figures.

NA—Not available.

Moreover, agriculture's burden on transport carriers is even greater than these statistics imply. Long rail hauls, particularly for grain and fertilizer—which now average about 1,000 kilometers (km)—mean a large number of stations, yards, and men are involved in forwarding shipments. Long-distance shipments also tie up scarce rolling stock for longer periods of time per shipment. Agricultural cargoes also require special handling far beyond that required for bulk industrial raw materials which make up the greater share of rail traffic and a large share of highway haulage. Some goods—such as grain—are highly combustible and require extra caution in loading and unloading. Other products—such as fruits

² Narkhoz 1970, p. 339, Narkhoz 1985, p. 270, DI Research Paper ER 77-10557, Unclassified, *Impact of Fertilizer on Soviet Grain Output, 1960-80*, November 1977, p. 19, and *Vestnik statistiki*, No. 3, 1986, p. 80.

³ Deliveries of industrial goods to agriculture—largely machinery, equipment, and agrochemicals—which were equivalent to roughly 12 percent of the gross value of agricultural output (GVO) in 1959, have increased markedly, accounting for an estimated 25 percent by 1982. In absolute terms, deliveries of industrial goods and services grew by nearly four times from 1959 to 1982. In addition, the estimated share of farm output being industrially processed increased from 40.4 percent of GVO in 1959 to 53.3 percent in 1982. In absolute terms, the value of farm output being processed nearly doubled, rising from 31 billion rubles in 1959 to 68 billion rubles in 1982. Adding to on-farm transport needs was a 60-percent increase in the value of farm production used internally, much of which is livestock feed and seed. These shares are estimated from input-output data (only available for benchmark years; the Center for International Research, US Department of Commerce has just completed a reconstruction of the 1982 Soviet input-output table, for example) and Soviet statistics on GVO in comparable prices.

and vegetables—are easily bruised or damaged. All agricultural goods require high standards of vehicle cleanliness to avoid contamination. Finally, the seasonality of agricultural production concentrates the burden of shipments into relatively brief periods of intense activity. According to the Soviet press, 38 to 40 percent of all agricultural freight shipped by rail occurs during September to November, compared with only 15 to 16 percent in May to July.⁴ Highway shipments are skewed even further with nearly half of all agricultural freight shipments in the RSFSR, for example, occurring in July to September and one-fourth during October to December.⁵ In years of high crop yields—grain production increased by 80 million tons in 1976 over the 1975 level, for example—the burden becomes almost unmanageable.

The agricultural sector in the USSR is immense, currently claiming roughly one-third of total annual investment (including housing and services) and employing nearly 30 percent of the labor force.⁶ Farm production alone claims about 20 percent of annual investment and of the labor force in comparison with less than 5 percent for each in the United States. Moreover, the USSR farms about one-third more land than does the United States, but the value of output per hectare in the USSR averages only 56 percent of that in the United States.⁷

Agriculture's 1.8 million trucks—some two-thirds of which are on farms with the remainder in organizations supplying and servicing farms and processing farm products—represent more than one out of every five in the country. In addition, the sector receives an even larger share of annual truck deliveries than its inventory share would imply because trucks in agricultural use are retired more rapidly than trucks in other sectors.

The agricultural sector also consumes much of the nation's petroleum products—diesel, gasoline, and motor oils. Soviet authors estimate that in the early 1980s the sector absorbed 40 to 45 percent of the country's total diesel fuel, 30 to 35 percent of the gasoline, and up to 50 percent of the motor oils.⁸ Non-transport farm operations and production probably account for most diesel fuel use and some motor oil as well, but much of the gasoline goes for trucking operations. Indeed, the enormous tonnages moved to and from the farm, as well as on the farm, suggest that transport may claim as much as half of the total agricultural allocation of oil products and fuel use will remain high. The agricultural sector will continue to receive 30 percent of the country's gasoline and 40 percent of the diesel fuel in support of the Food Program.⁹

⁴ *Voprosi ekonomiki*, No. 4, 1975, p. 52.

⁵ M.S. Khodosh, *Gruzovyye avtomobil'nyye perevozki*, Moscow: Transport, 1986, pp. 133–134.

⁶ The agricultural sector includes not only farms but also several branches of industry supplying farms with materials such as tractors and other farm machinery, repair services, and agrochemicals, as well as those branches of industry that process farm products.

⁷ JEC, *Soviet Economic Prospects for the Seventies*, USGPO, Washington: 1973, pp. 358–361, updated using the USSR index of net agricultural production and the US index of net agricultural production from US Department of Agriculture, *Agricultural Statistics 1980*, p. 440, and *Ag. Stat. 1985*, p. 391.

⁸ V.V. Ryndin, *Goryuche-smazochnyye materialy v sel'skom khozyaystve*, Moscow: Znaniye, May 1981, p. 3.

⁹ The Food Program, announced by Leonid Brezhnev in 1982, aims to improve the entire chain of food production—from farm, through processor, to consumer. *Ekonomika sel'skogo khozyaystva*, No. 8, 1986, p. 5.

Despite the large volume of transport resources devoted to agriculture, the administration of these resources—especially of trucking—has been diffused among several more or less autonomous organizations and development of the rural transport network has not kept pace with the growth in demand.¹⁰ This has given rise to bottlenecks in transport supply that from time to time require special effort by the military and industrial sectors to overcome. During the harvest season, for example, agriculture's claim on the national truck fleet reportedly swells by another 700,000 to 800,000 vehicles, drawing transport resources away from other sectors.¹¹

II. THE COST OF INADEQUATE TRANSPORT FACILITIES

The main cost of agriculture's overtaxed and underdeveloped transport system is the enormous loss of farm products and inputs that occurs during transportation and storage. Speaking at the Supreme Soviet Presidium in Moscow on 31 May 1982, Brezhnev noted that losses of grain alone run as high as 20 percent of the annual harvest. This is equivalent to 90 percent of the average annual volume of grain imported during 1981–85.

Gorbachev himself described the potential payoff from reducing agricultural losses in his report to the 27th Party Congress, March 1986, when he noted that the cost of eliminating losses would be one-half to one-third the cost of obtaining the same supply through additional production. In June 1986, he stressed the need to "take in without losses" all crops, and in September repeated the importance of reducing losses to the success of the Food Program during his walkabout in Krasnodar.¹² Although losses are caused by a number of factors, inadequate transport and storage are among the largest sources and are interdependent.¹³

The distance products have to move is a major factor in the losses equation. Now-retired Minister of Agriculture Valentin Mesyats in a 1984 interview commented that when tomatoes are moved more than 25 km, the amount remaining in first-grade condition is 80 to 85 percent; when the distance is over 100 km, only 40 percent remain in first-grade condition.¹⁴ Time spent "on the way" adds substantially to losses. Farm produce being moved by rail frequently takes as much as 15 to 18 days to reach the delivery point.¹⁵ Milk often has to be moved 200 or more kilometers, even in hot weather, and cattle and hogs being shipped to slaughter spend as much as 3 to 4 days in transit.¹⁶ Refrigerated and ventilated rail cars and trucks are in short supply, and use of chemical preservatives is prohibited by Soviet law.

Product losses also extend to farm inputs. Failure to deliver adequate quantities of agrochemicals, machinery, spare parts, and other crucial resources to farms on time seriously hampers achiev-

¹⁰ See Appendix A.

¹¹ See, for example, *3a rulem*, No. 4, 1977, p. 3, and Brezhnev's speech at the October 1968 Agricultural Plenum.

¹² *Pravda*, 17 June 1986, p. 3, Moscow Domestic Service, 18 September 1986, printed in FBIS Daily Report, *USSR National Affairs*, 19 September 1986, p. R1.

¹³ See Appendix B.

¹⁴ FBIS Daily Report, *USSR National Affairs*, 10 October 1984, p. T3.

¹⁵ *Ekonomika sel'skogo khozyaystva*, No. 3, 1983, p. 23.

¹⁶ *Slovo lektora*, No. 2, 1986, p. 25.

ing gains in crop output. Not only are deliveries frequently too late to enable necessary field work to progress, but the quantities finally delivered are often less than needed—partly because of losses en-route and partly because of production constraints.¹⁷ Moreover, storage facilities for key materials such as chemical fertilizers are inadequate.¹⁸ Construction of new storage facilities has scarcely kept pace with steadily increasing allocations. Soviet scientists claim that each ton of fertilizer nutrients produces 4 to 5 tons of grain.¹⁹

III. THE MAIN PROBLEMS

A. INADEQUATE ROADS

An inadequate road network probably tops the list of causes for agricultural losses by the transport system. One Soviet writer in the early 1980s blamed "lack of roads"—probably meaning both inadequate quantity and quality—for 5-7 billion rubles in agricultural losses annually, or 4 to 5 percent of the gross value of farm output as measured by the USSR, while another blamed "lack of roads" for crop losses equivalent to 7 to 8 percent of the gross value of crop output.²⁰ Despite a long-standing policy aimed at encouraging rural roadbuilding, the USSR reported that 11 percent of regional centers and 18 percent of collective and state farms in 1985 still had no reliable link to the main road system.²¹ In contrast, in the United States nearly all towns and villages are linked by paved roads and very few farms (largely in remote mountain areas) do not have direct access to paved roads.

Increasing the traditionally low priority for roads in rural areas in the USSR is difficult. Construction and maintenance of off-farm roads is controlled by the republic ministries of highways or their subordinate trusts, which are already fully employed improving the inadequate stock of general-purpose roads connecting larger population centers.²² Moreover, for over 25 years the responsibility of financing rural roads has been placed mainly on the rural areas, primarily the farms themselves, which cannot meet this extra burden given already heavily strained resources.²³

Yet, even if the Soviets boosted the priority for rural roads, the problem of losses would be far from solved. A large share of losses probably results from the poor condition of on-farm roads. A Deputy Chairman of the RSFSR Council of Ministers claimed in a 1986 article that his republic had 480,000 km of roads within farms, only 59,000 of which were hard surfaced.²⁴ This is far short

¹⁷ Zvyazda, 7 March 1985, p. 1.

¹⁸ See *Agrokhimicheskaya sluzhba sela*, No. 12, December 1982, p. 21, for example.

¹⁹ *Ibid.*

²⁰ *Ekonomika sel'skogo khozyaystva*, No. 10, 1983, p. 11, and *Pishchevaya promyshlennost'*, No. 4, 1983, p. 13.

²¹ *Automobil'nyye dorogi*, No. 1, 1986, p. 2.

²² There is no all-union ministry of highways, but the major interrepublic road network—the Soviet equivalent of the US defense highway system—enjoys national support for funding and priority for materials. Although most of the roads in this system are hard-surfaced, many of them are only two lanes wide.

²³ *Pravda*, 15 March 1971, p. 2.

²⁴ *Automobil'nyye dorogi*, No. 1, p. 2. "Hard surface" in Soviet parlance includes nearly any improved surface beyond dirt. More than 80 percent of Soviet public roads have been raised to this level. The Soviets use the more exclusive term "modern surface" when surfaces are composed of concrete or asphalt. Less than half of all public roads qualify for this description.

of the 1.2 million km of on-farm roads the Soviets claim are necessary in the republic.²⁵

The rural transport problem is of enormous magnitude. For example, the need for hard-surfaced roads on RSFSR farms—estimated by the Soviets at 600,000 km—exceeds the total stock of hard-surfaced roads in the entire RSFSR today, and is greater than the additions to the stock of hard-surfaced roads nationally over the last 15 years, during which time Moscow made a major effort to improve the national road system.²⁶ Resources for rural road construction are decentralized, making rapid improvement similar to the national experience highly unlikely.²⁷

Development of hard-surfaced roads not only is important for reducing losses but also for reducing costs of both inputs and products. Use of hard-surfaced roads instead of unsurfaced roads in the rural areas increases the amount vehicles can haul by 80 percent, increases speed by a factor of 2 to 3, cuts fuel expenditures in half, and reduces expenses for vehicle repair greatly.²⁸

The lack of adequate hard-surfaced roads is particularly apparent during the flooded and boggy conditions that prevail during the annual spring thaw. Although few crops are moved at this time, supplies must be delivered to farms, feed to animals, and live animals, milk, and eggs must be moved to processing and procurement points. According to the Soviet central press, "at times there is nothing we can do about impassable roads, all transport stands still except for a few powerful tractors."²⁹

B. SHORTAGES OF TRANSPORT EQUIPMENT

Agricultural losses also result from an inadequate supply of transport equipment in good repair. Although inventories of trucks in the agricultural sector increased by nearly 600,000 to almost 1.8 million between 1970 and 1984, the current ratio—about three trucks per 1,000 hectares of arable land—is still somewhat less than half the number that Soviet planners consider necessary to avoid delays.³⁰ Moreover, the rugged treatment that trucks undergo because of poorly surfaced or unsurfaced roads reduces the number of available trucks in working order. Difficulties in maintaining farm trucks compound the problem. The nationwide shortage of vehicle spare parts, repair and maintenance facilities, and

²⁵ *Trud*, 20 May 1979, p. 2. On-farm roads are far more important in the USSR than in the United States. The average state farm in the USSR covers over 16 thousand hectares and the average collective farm about 6.5 thousand hectares, compared with average farm size of about 180 hectares in the United States. A state or collective farm may include several villages, some with schools and other amenities, such as small hospitals, farm-product processing facilities, and other small-scale industries to produce construction materials and consumer goods from local raw materials.

²⁶ *Narkhoz* 1985, p. 336.

²⁷ The Chief of the Main Administration for Capital Construction in the RSFSR Ministry of Agriculture in 1980 commented that responsibility for only 20 to 25 percent of the total volume of road construction on collective and state farms fell to organizations of the republic highway ministry, which have the best network for supplies of material, equipment, and skilled manpower. *Khozyaystvo i pravo*, No. 10, October 1980, pp. 15–18 as translated in JPRS 77479 *Transportation* No. 35, 27 February 1981. The rest of the work—financing, material acquisition, and physical construction—fell on the shoulders of the republic Ministry of Agriculture or the farms themselves.

²⁸ *Sovetskaya Rossiya*, 19 March 1980, p. 2.

²⁹ *Izvestiya*, 10 October 1981, p. 3.

³⁰ Based on requirements for some regions in the Western parts of the European RSFSR. See *Ekonomika sel'skogo khozyaystva*, No. 2, 1983, p. 19, for example.

qualified repair personnel is far more pronounced in rural areas than in cities. Farm trucks reportedly are out of operation an average of at least 40 days each year because of inadequate repair or servicing.³¹

Many Soviet articles have focused on the supply of inappropriate, broken, or otherwise unusable railway and highway rolling stock for shipping agricultural products and misuse of specialized agricultural rolling stock. Fertilizers, fuels, and grain leak in substantial quantities from railcars.³² These problems arise mainly from a lack of cars specially suited for shipping bulk agricultural products and from improper conversions of general-purpose freight cars to agricultural use. For example, workers often fail to install grain panels before the cars are loaded. Moreover, a chronic lack of refrigerated trailers and rail cars reduces quality and increases spoilage. Only about half of all rail-shipped perishables are moved in refrigerated equipment.³³

Transport also has been blamed for losses that affect agriculture indirectly. For example, transportation problems complicate both the shipment of output from and raw materials to fertilizer producers.³⁴

C. INEFFICIENT USE OF TRUCKS AND FUELS

The Soviet press condemns agriculture for its inefficient use of trucks and fuels. The low productivity stems in part from the long downtimes caused by rugged treatment and poor maintenance, which in turn contribute to excessive fuel use. According to one Soviet author, unit fuel consumption (grams of standard fuel per ton-kilometer of traffic) by agricultural trucks is double that for the common carrier fleet and 30 percent higher than that of other departmental carriers.³⁵

In addition, past policies that focused on steadily increasing the stock rather than the productivity of trucks have not encouraged efficient use of the available truck park. Finally, the emphasis on developing large, centralized facilities for processing agricultural products and on transferring shorthaul transport from rail to truck has added to the length of truck hauls, which has further reduced productivity. In 1982, Gorbachev (then the Politburo member responsible for agriculture) declared that rational siting of meat-processing facilities would preclude shipment of animals more than 150 km.³⁶ Present facilities, however, are irregularly distributed, and animals are often transported "literally thousands of kilometers." Soviet authors blame such centralization for longer hauls of feeds, fertilizers, and equipment. In the Ukraine, for example, the average haul for agricultural equipment and supplies was 40.4 km during 1981-83, compared with only 23.5 km in 1966-70.³⁷

³¹ *Ekonomika sel'skogo khozyaystvo*, No. 10, 1983, p. 11.

³² *Sel'skaya zhizn'*, 17 September 1982, p. 2, provides some examples.

³³ *Planovoye khozyaystvo*, No. 12, December 1983, pp. 72-78 printed in JPRS-UTR-84-002, 3 February 1984.

³⁴ *Zvyazda*, 7 March 1985, p. 1.

³⁵ *Dostizheniya i perspektivy: Energetika i toplivo*, No. 7, 1985, pp. 96-103.

³⁶ *Kommunist*, No. 10, 1982, p. 11.

³⁷ *Ekonomika sel'skogo khozyaystvo*, No. 12, 1985, p. 60. The Soviet press occasionally reports that some progress toward reducing hauls has been made over the past few years by constructing new processing facilities closer to production sites. But the same reports note that progress is slow. See, for example, *Sel'skoye khozyaystvo Rossii*, No. 10, 1986, pp. 2-4.

IV. COPING WITH THE PROBLEMS

A. THE OFFICIAL LINE

Gorbachev has not provided a specific agenda for dealing with the problems of agricultural transportation, but his major speeches and his 1986-90 economic plan indicate that the commitment toward at least coming to grips with the problems is there.³⁸ In his report to the 27th Party Congress in February 1986 and again in his address to the Central Committee in June 1986, Gorbachev ratified his predecessors' commitment to reducing agricultural losses. Furthermore, many of his speeches indicate that he intends to more aggressively attack the problem of rural infrastructure, especially by increasing investment in the so-called "non-productive sphere." The most frequent item mentioned in this connection is rural housing, but the rural road system also would be a major beneficiary of such emphasis. Finally, the 1986-90 Five-Year Plan clearly continues support for the broad transport directions outlined in the Food Program, particularly deliveries of new transport equipment to agriculture and the emphasis on development of rural transport.³⁹

Gorbachev inherits more problems than solutions to the difficulties of agricultural transportation. Despite the consistency with which many of these policies have been restated over the years, the record of his predecessors in improving overall agricultural transportation has been poor. This has not been because of inattention but results from the sheer vastness of the problem, particularly in rural areas. Even a major effort to solve it would result in only moderate gains.

Gorbachev probably will be the beneficiary of moves begun by his predecessors to resolve agricultural transport problems outside of the rural areas. For example, considerable work has been done to improve rail rolling stock for expediting agricultural haulage.

B. POLICIES IN PRACTICE

1. Top priority to expediting grain imports

Gorbachev strongly wants to reduce food imports, particularly grain. His predecessors too shared this hope, but perhaps recognizing the periodic need to bring in large quantities of grain, they appear to have concentrated first on improving transportation of imported grain. Ports on the Baltic and Black Seas and in the Soviet Far East have been greatly upgraded since the commitment was made in the early 1970s to limit the impact of poor domestic

³⁸ For a discussion of the development of the USSR's plans for agriculture in the 1980s see P. Doolittle and M. Hughes, "Gorbachev's Agricultural Policy: Building on the Brezhnev Food Program," in this volume.

³⁹ The Food Program provides explicit targets for increasing the supply of specialized trucks and freight cars, other agricultural equipment, and storage facilities. The program's considerable attention to improving rural infrastructure also in part reflects Moscow's desire to reduce losses by improving farm-to-market transportation as well as by increasing on-farm storage and processing facilities. It promises increased investment in rural areas—largely to improve housing and living conditions, but also to improve agricultural productivity. Better rural roads would reduce travel time for farm workers, cut the need to use tractors for transportation, improve truck productivity, and speed up deliveries of both resources to farms and products to consumers.

grain crops on meat production by importing substantial quantities of grain.

The USSR felt the squeeze of limited transport facilities during the 1981/82 crop year when a poor grain crop led to then-record grain purchases from the West. Movement of imported grain was hampered by the domestic rail system's inability to expedite port clearing. Reports of 6- to 8-week delays for ships waiting to discharge grain were common. Three years later, during the 1984/85 crop year, Moscow was able to handle more than 55 million tons of imports—roughly 20 percent more than in 1981/82—with relative ease.

The temporary choke point was relieved by broad improvement in the rail transport system during the intervening years, the fielding of greater numbers of specialized grain freight cars—both new hoppers and specially equipped boxcars—to the ports, and some enhancement of port equipment. In addition, in 1984/85 much more grain was moved in larger ships—45,000 to 100,000 tons.⁴⁰

Despite plans to increase domestic grain production substantially, the Soviets continue to improve their ability to offload and move imported grain from major ports. Moscow imported a substantial amount of new offloading equipment in the early 1980s to expedite grain handling—either by replacing or augmenting the existing equipment. In addition, two new grain handling complexes are scheduled to come into service during the 1986–90 period. Novotallinsk—an entirely new port on Muuga Bay near Tallinn, Estonia—brought the first part of its scheduled 5 million tons of annual offloading capacity into service late in 1986 at a budgeted cost of 350 million rubles. The new port will accommodate ships of up to 100,000 deadweight tons at quayside. This is two and one-half times the capacity of existing berths at Baltic ports and will enable Moscow to avoid costly transloading to smaller ships. A second new grain harbor of 2.5 million tons capacity is scheduled for construction at Vostochnyy, a major port under development in the Far East.

2. Solving problems for the railroads

Gorbachev also has benefited from past efforts to improve the railroads. The upgrading probably resulted from the urgent need to improve overall rail operations in the late 1970s and early 1980s when transportation bottlenecks contributed substantially to an overall economic slowdown. Agriculture's priority was demonstrated in particular by the production of new specialized rolling stock. During the early 1970s, the Soviets set the stage for a greatly improved stock of cars for hauling agricultural freight and, since 1975, have been steadily improving it—even in the face of a striking falloff in freight car production for all end users by 19 percent between 1975 and 1983.⁴¹

⁴⁰ In the 1981/82 crop year, the U.S. partial embargo on grain sales to the USSR forced the USSR to turn to other countries such as Argentina for needed grain. Because Argentina's grain loading ports could not handle large ships, a major portion of that grain moved in smaller ships—averaging about 25,000 tons—which tied up Soviet port facilities and reduced unloading efficiency.

⁴¹ Statistics on Soviet freight car production appeared regularly in *Narkhoz* until 1984 when they were abruptly discontinued.

Sixty percent of grain is now delivered in specialized cars, about half in specially converted boxcars and the rest in specialized grain cars—mostly hopper cars.⁴² Gorbachev's team has decided to expand the use of dedicated rail equipment. All grain shipments in the future are to be moved in specialized grain cars.⁴³ The use of hopper cars—which the Soviets equip with special loading hatches on top—has reduced loading and unloading times for bulk freight such as grain and fertilizer, thus speeding up freight car turnaround times, an important factor behind improved railroad performance.

The Soviets are also improving their stock of rail cars for shipment of perishable agricultural products. The Food Program envisaged delivery of 29,000 to 30,000 refrigerated and insulated cars during the 1980s; partly from increased domestic production but also from stepped-up imports.⁴⁴

Although specialized freight cars are an important ingredient for expediting agricultural shipments by rail, Gorbachev's planners must be careful now to provide the parallel infrastructure needed to make the investment pay off. For example, although the benefits of using specialized grain cars at Soviet ports where modern loading and unloading equipment is available are clear, hundreds of domestic transfer stations do not have comparable machinery and equipment. In 1983 some 40 percent of the stations responsible for accepting "express grain trains" (dedicated unit trains) could not unload specialized hopper cars.⁴⁵ Providing such machinery for hundreds of stations is costly. The Soviet railway newspaper, *Gudok*, notes that half a billion rubles had been spent during 1981–84 to upgrade equipment at railroad stations that handle agricultural freight shipments.⁴⁶ This is only a small share of the 19 billion rubles invested in the entire rail transportation network over the period, but it indicates that some provision was made to provide supporting infrastructure.

Moscow continues to be plagued by problems in moving key agricultural inputs from industry to the farm. In particular, rail transport difficulties, which have generally subsided over the past two to three years, seem to persist for chemical fertilizer producers, probably resulting largely from belated development of specialized rolling stock. The Soviets seem to be searching for the right design and materials to build cars that can both carry corrosive chemicals and

⁴² The Kremenchug Railroad Car Plant—the Soviets' main hopper-car builder—moved a new 65-ton model into production in 1976 and then replaced this model with a 70-ton model in 1982. Production capacity will be 12,000 cars per year, which will be used for grain, chemical fertilizers, and other bulk loads. In addition to new domestic production, Moscow also signed an agreement in 1981 to purchase an additional 20,000 grain cars from Romania by 1985. *Zheleznodorozhnyy transport*, No. 10, October 1985, pp. 35–36 printed in JPRS-UTR-86-006, 21 April 1986, p. 73; *East European Agriculture*, November 1984, p. 4, quoting *Sel'skaya zhizn': Sotsialisticheskaya industriya*, April 10, 1984, p. 1.

⁴³ *Zheleznodorozhnyy transport*, No. 10, October 1985, pp. 35–36 as printed in JPRS-UTR-86-006, 21 April 1986.

⁴⁴ Most of the Soviet refrigerated stock is provided by the twin plants Bryansk (in the Soviet Union) and VEB Waggonbau Dessau (in East Germany). By the early 1980s these plants had delivered some 5,000 five-car refrigerated sections to Soviet railroads as well as a sizable number of individual refrigerated cars. Data on deliveries of refrigerated stock are derived from various claims in the Soviet and East German press.

⁴⁵ *Zheleznodorozhnyy transport*, No. 8, August 1983, pp. 18–23 as printed in JPRS 84855, *Transportation* No. 137, 1 December 1983.

⁴⁶ *Gudok*, 16 August 1985, p. 2 as printed in JPRS-UTR-86-001, 24 January 1986.

have a reasonable life expectancy at a reasonable cost. Moscow can only overcome these types of technical problems by pouring more money into domestic development of specialized cars or by importing such cars from abroad.

3. Some retrenchment on the truck issue

As the 1970s unfolded, Moscow became more concerned about resource constraints in general, and, in turn, about agriculture's continued dominance as a truck claimant especially when the needs of other, more efficient users were being shortchanged. Truck allocations to agriculture—both plans for future direct deliveries and temporary allocations at harvest time—began to change in the mid-1970s. For example, the automotive industry over the last ten years favored the development of heavy trucks, more appropriate for use by general-purpose trucking—particularly for inter-city deliveries—and the military than for agriculture.

Although plans have been on the drawing board for some time to modernize the Gorkiy Motor Vehicle Plant (GAZ)—whose medium-sized trucks comprise two-thirds of the agricultural truck fleet—implementation has lagged behind other higher priority automotive projects such as the huge Kama River truck and Volga automobile plants and the modernization of other existing truck factories such as the ZIL plant. All these projects were primarily intended for non-agricultural truck production. Work on the Kutaisi truck plant, however—which according to the Food Program will produce 20,000 heavy truck-trailer combinations for agriculture—has been pushed forward. Now, however, Gorkiy's turn appears to have come according to Yuriy Kristoradnov, chairman of the Gorkiy oblast committee, in his speech at the 27th Party Congress in March 1986.⁴⁷

Increased use of both new Kutaisi and Kama truck and trailer combinations will help expedite some agricultural shipments, but the effects will not be widespread. The size of the trucks suggests they will be used to move products only on relatively good roads. Moreover, these new, modern, Soviet trucks require "intelligent operation," which "can be achieved only with an adequate material and technical base for motor transport . . . (that) most collective and state farms do not have. . . ." ⁴⁸

Efforts to reduce the number of trucks used in the harvest appear to be paying off. The RSFSR, which had needed roughly 700,000 additional vehicles for the harvest, used 13 percent fewer trucks during the 1984 harvest than in 1980.⁴⁹ The decline was, in part, the result of an increase in truck productivity. Compared with 1980, the amount of agricultural products hauled increased by 6 percent, while average daily shipments per truck were up nearly 20 percent in 1984.⁵⁰

⁴⁷ *Pravda*, 4 March 1986, p. 6.

⁴⁸ *Sel'skoye khozyaystvo nechernozemya* No. 8, August 1983, pp. 10-11 as printed in JPRS UAG-84-017-6, 24 September 1984, pp. 1-4.

⁴⁹ *Sel'skaya zhizn'*, 8 December 25, 1984, p. 2 as printed in JPRS-UTR-85-006, 28 March 1985; *Automobil'nyye transport*, No. 6, June 1985, pp. 14-17 as printed in JPRS-UTR-85-011, 7 October 1985, pp. 25-31; *Zakupki sel'skokhozyaystvennykh produktov*, No. 11, 1986, p. 9, noted that the Kuban, a major grain-growing area in the RSFSR, traditionally required an additional 12,000 trucks for the harvest, but in 1986 needed only 3,000 more.

⁵⁰ *Automobil'nyye transport*, No. 6, June 1985, pp. 14-17 as printed in JPRS-UTR-85-011, 7 October 1985, pp. 25-31.

Improvement in the structure and use of the agricultural truck fleet throughout the rest of the decade and into the 1990s is likely. Production of trucks for agriculture at the Kutaisi plant will be increasing throughout 1986-90 and be in full swing by 1990. The GAZ face-lift will promote production of more fuel-efficient trucks with slightly larger carrying capacity. However, the GAZ reconstruction—planned to be completed by 1990—probably will suffer from chronic problems in keeping large capital projects on schedule, and the odds are good that all the work will not be finished by that date. Moreover, hard currency problems may further drag out the project by preventing Moscow from getting needed equipment from the West. Still, Moscow's high esteem for the technological innovations and new truck models intended for GAZ will help to counter these delays.

The Food Program provided specific goals for delivery of specialized vehicles such as livestock trucks, milk tankers, and refrigerated trucks to handle expanded production of perishable products. However, the 1986-90 Plan, while continuing the spirit of support for specialized highway vehicles, did not repeat the specific targets for these categories of trucks. The absence of specific targets may reflect deemphasis, impracticality of the original goals, or simply a continuation of a gradual reduction of published statistics on transport equipment that has taken place since 1982.

4. Roads—still a huge problem

It is on the issue of improving rural roads that Gorbachev faces his greatest challenge in improving agricultural transportation. Plans call for the building of 130,000 km of public roads in rural areas and 150,000 km of paved on-farm roads during the 1980s.⁵¹ Comparable national figures for earlier years are not available, but historical road construction statistics suggest that Moscow will have trouble reaching these targets. During 1986-90 the construction program for hard-surfaced on-farm roads in the RSFSR alone is said to represent a doubling of the network there.⁵² Only 53,000 km of paved rural off-farm roads were to be constructed during the 1981-85 Plan period—leaving Gorbachev's team with some 60 percent to be completed during 1986-90. Moreover, the 1986-90 Plan target for construction of paved on-farm roads is 92,000 km—implying that almost two-thirds of the 1981-90 goal of 150,000 km remains to be completed.⁵³ The lack of national statistics on investment in and construction of roads during the 1980s precludes any assessment of progress toward these goals.

Although Moscow claims that each ruble invested in rural roads provides a fourfold return in terms of decreased product loss, wear and tear on trucks, and fuel use, finding the rubles for construction, particularly in the more remote areas, will continue to be a

⁵¹ *Planovoye khozyaystvo*, No. 12, December 1983, pp. 72-78.

⁵² *Automobil'nyye dorogi*, No. 1, 1986, pp. 1-4.

⁵³ Assuming an absolute minimum definition of paved road—improved dirt with some gravel surfacing—Soviet cost estimates indicate that fulfilling goals for national rural and on-farm road construction would require investment of at least 2 billion rubles. The sums could easily climb to four times that amount if additional grading or improved surfacing is involved. The midpoint of these estimates is consistent with planned allocations of 4.6 billion rubles for rural public road construction in 1981-85, an increase of 40 percent over 1976-80 and one-fourth of total highway investment.

major problem. The republic ministries of highways, key players in local distribution of these funds, appear to concentrate on road construction in and near the larger populated points. Gorbachev is calling for a substantial increase in investment in rural infrastructure during the 1986-90 period—up 38 percent over the 1981-85 period—but it is not clear how he will provide the funds given the competing demands of other priority programs, especially in machine building and energy. Soviet journals also have recommended that the responsibility for rural road construction be expanded from the republic highway ministries and farms to include all players in the agroindustrial complex.⁵⁴ Road construction, however, is not just a function of rubles; it requires men, machinery, and construction materials. Probably the most serious constraint is lack of construction materials—particularly crushed stone and asphalt—and roadbuilding machinery.⁵⁵

Even if Gorbachev is able to pull off the planned level of rural construction, however, it will only be a start on solving the rural road problem. For example, the planned stock of 118,000 km of hard-surfaced, on-farm roads in the RSFSR by 1990 represents only 20 percent of the 600,000 km the Soviet press claims is required. Consequently, the effort to improve and expand rural roads must continue well into and probably beyond the 1990s. This kind of long-range commitment will require Gorbachev to support deeper development of the rural infrastructure. For example, the simple act of expanding the highway system multiplies the burden on rural construction organizations by creating an even larger stock of roads to be repaired and maintained.

V. OUTLOOK

Over the remaining years of the current five-year plan (1987-90), the Soviets will make some progress in improving off-farm transportation—at least for the products of agriculture. The preparatory investment has already been made to upgrade the fleets of both rail and highway rolling stock with specialized equipment for carrying grain, perishable crops, animals, livestock products, and processed foods. On the other hand, improving transport of inputs to agriculture—particularly agrochemicals—paradoxically depends more on non-transport factors, such as storage, than on transport.

Gorbachev must now turn his attention to rural areas and the farm. Indeed, he has promised investment increases for rural infrastructure, and his 1986-90 plan for highway building emphasizes rural roads. Plans for automotive plants imply increased investment to support agriculture by producing more trucks suited to agricultural use. Plans for non-agricultural truck production imply a shift to diesel trucks, which would lessen competition for the scarce gasoline needed by most agricultural trucks. All of these “plans,” if implemented, imply a real improvement in the rural transport situation.

However, as in the past, not all plans for improvements will be carried out. For example, the enormous investment required to up-

⁵⁴ *Planovoye khozyaystvo*, No. 12, December 1983, pp. 72-78 as printed in JPRS-UTR-84-002, 3 February 1984.

⁵⁵ See, for example, *Kazakhtanskaya pravda*, 14 August 1985, p. 2.

grade rural roads is a major obstacle for the authorities. Moscow, with many high-priority claimants for centralized investment funds, may not be able to augment stepped-up rural capital formation. Moreover, rural construction, including road construction in general, has always been difficult to manage because there are so many participants. The churning and confusion of the current reorganization of both the agricultural and construction sectors under Gorbachev is adding to the problem.

On the truck side, although the Gorkiy Motor Vehicle Plant—agriculture's main truck supplier—is next up for renovation, it will be difficult for Soviet planners to keep the project on schedule. Delays in capital construction in general, together with the USSR's tight hard currency situation, which may restrict any foreign contribution to the effort, are likely to slow implementation of these plans, at least through the end of the decade. Finally, Moscow's more general goals to make better use of the existing agricultural truck fleet by improving the service situation in rural areas—for example, providing additional spare parts and maintenance for agricultural equipment—will also be very difficult to achieve. Indeed, providing an adequate supply of vehicle servicing facilities has yet to be tackled effectively even in major industrial areas.

On balance, the Soviets are not likely to solve their agricultural transport problems—particularly those on or near the farm—in the remaining years of the 1980s or probably the 1990s. Nevertheless, even a moderate but serious effort to expand rural roadbuilding and improve trucking and railroad service would help ease the burden of agriculture on the transport system and allow Moscow to slowly improve food supplies in the coming years.

However, planners must be cautious that a restrained approach to improving agricultural transportation does not backfire because of local tendencies to neglect less-than-campaign efforts from the center. Spotty progress, particularly if not accompanied by comparable improvements in handling, storage, and processing of food products, would merely shift present bottlenecks from one location to another.

APPENDIX A. TRANSPORTATION PLAYERS

Railroads dominate the long-distance haulage of raw materials and equipment from producers to agricultural areas; of agricultural products from procurement sites to centralized storage, feeding, or processing locations; and of processed foods to distributors. The All-Union Ministry of Railways has some control in balancing the needs for agriculture against other transport claimants, as well as planning, procuring, and delivering the right mix of rolling stock—from specially lined freight cars for hauling caustic fertilizers to refrigerated cars for meat and other perishables.

Trucks predominate over shorter distances on or near the farm. Unlike the rail system, the truck system is highly fragmented; management and subordination are vested in a number of entities:

- Glavagropromsnab*, the Main Administration for Technical Supplies and Services, was formed in late 1985 when Gorbachev merged six major entities into *Gosagroprom*, the State Agro-Industrial Committee. The full details of its structure are not yet known but it appears to include at least the following two organizations:

- Goskomsel'khoztekhnika*, the State Committee for the Supply of Production Equipment for Agriculture, largely controls deliveries of machinery and equipment, fuel, construction materials, and most other supplies to

farms. Local *Sel'khoztekhnika* organizations operate trucks and loan them for farm use.

Soyuzsel'khozkhimiya, formed in 1979, combined farm and *Goskomsel'khoztekhnika* elements to create a unified, specialized service to store, deliver, and apply agro-chemicals. Although several republics now have *Agropromsnab* departments, oblast and rayon level (smaller administrative units) *Sel'khoztekhnika* and *Sel'khozkhimiya* departments are currently operating under their original names.

- State and collective farms, which maintain large truck inventories, are responsible for most on-farm shipments and deliveries to procurement areas.
- Processing enterprises also have truck fleets and haul raw materials for processing.
- Republic ministries of motor transport supply trucks and drivers to farms and processing enterprises when needed. they also reportedly provide centralized operational control of the many trucks, drivers, and mechanics traditionally supplied by industry and the military to meet the brief but great need for additional transport during harvest.
- RAPOs, the regional agro-industrial associations set up under the Food Program, reportedly also provide some weak administrative coordination of these many transport authorities.

With so many players and conflicting ministerial ties, it is not surprising that during peak periods harvested crops continue to spoil because the promised transport is busy "someplace else."

River shippers are underdeveloped and largely insignificant as carriers of agricultural products, although they do move agricultural produce from the Caucasus area to population centers along the Volga-Don river systems. Maritime shippers also are relatively unimportant for moving domestic agricultural freight, although imports of agricultural products—particularly grain and raw sugar—represent a sizable share of total shipments and traffic of the maritime fleet.

APPENDIX B. PRODUCT LOSSES

Determining the extent of farm product losses attributable to transportation is difficult. Soviet statisticians argue the need for analyzing the extent and causes of farm product losses. In addition to transport constraints, product losses can be the result of:

- Lack of processing capacity.*—Low investment priority has kept the food-processing industry from adding sufficient capacity to handle the increasing quantities of raw materials coming from the farm and from reequipping facilities with modern machinery. Many steps in food processing are still performed manually.
- Lack of proper storage facilities.*—Currently, agriculture has only 36 percent of the storage space it requires, according to an authoritative Soviet journal. The priority of grain vis-a-vis other crops is evident in Soviet statements that nearly 70 percent of the storage capacity needed for grain has been built. Figures for vegetables and potatoes and for fruit are far less satisfactory, 32 percent and 47 percent, respectively. According to the Soviet technical press, proper storage facilities—those that are air-sealed and effectively prevent spoilage—exist for only 40 percent of silage and haylage, key livestock feeds.
- Lack of incentives.*—Little connection exists between effort expended and reward gained—personal initiative is not encouraged and a sense of personal responsibility is nonexistent.
- Shortages of crates and containers.*—As many as 12 loading and unloading operations occur between harvesting and delivery to the processor or consumer. Substantial waste results from excessive handling and delay.
- Shortages of labor.*—Farm managers are loath to send workers with trucks to carry goods beyond the farm when they could more profitably be employed on the farm. Receiving points traditionally are undermanned and also suffer from a lack of automated materials-handling equipment.

Another Soviet source puts agricultural losses much lower than the general statements; average product losses at the "stage of delivery of raw materials to processing," presumably those which could be attributed to transportation, comprise 6.6 percent, and of livestock, grapes, and vegetables, 10 to 12 percent. Rates as low as these suggest a very limited definition of the delivery stage. The US Department of Agriculture estimates that about 20 percent of all fresh fruits and vegetables picked

in the United States never reach the consumer because of losses related to natural ripening and aging, stresses such as chilling, and insects and micro-organisms. Losses of grain attributable to transport are estimated to be less than 1 percent in the United States.

THE NUTRIENT CONTENT OF THE SOVIET FOOD SUPPLY AND COMPARISONS WITH THE U.S. FOOD SUPPLY

By Ann M. Lane,* Ruth M. Marston,** and Susan O. Welsh**

CONTENTS

	Page
I. Summary.....	79
II. Introduction.....	80
III. Changes in the Calorie and Nutrient Content of the Soviet Food Supply and Comparisons With the U.S. Food Supply.....	81
IV. Consumer Satisfaction.....	83
V. Dietary Deficiencies.....	83
Appendix. Methodology.....	86

I. SUMMARY

The nutrient content of the Soviet food supply resembles that of the US food supply in many respects. The per capita level of food energy (calories) nearly matches that in the United States. The protein level also nearly equals that of the US food supply. The level of carbohydrate remains higher, and that of fat lower, but the gaps have narrowed somewhat since 1965. For the most part, per capita levels of specific vitamins and minerals in the USSR's food supply are close to those in the United States. With one exception, the per capita levels of vitamins and minerals for most of the period studied are also above US or Soviet recommended dietary allowances (RDAs). Shifts in the structure and nutrient content of the Soviet food supply occurred from 1965 to 1981, largely as a result of the increased availability of animal products. While the per capita level of food energy increased 6 percent, the level of protein increased 8 percent, and that of carbohydrate decreased 2 percent. The most pronounced change occurred in the per capita level of fat, which increased 26 percent during the period studied. The share of protein in the food supply from animal products also increased markedly, from one-third to nearly one-half. Most of the changes occurred in the 1965-75 period.

The findings of this study suggest that the impact of shortages of quality foods—items high on the Soviet consumer's scale of preferences—may be primarily upon consumer satisfaction rather than on physiological need. The marked improvement in availability of meat, milk and milk products, and some fruits and vegetables that occurred through the mid-1970s enhanced consumer welfare in the

*Office of European Analysis, Central Intelligence Agency.

**Human Nutrition Information Service, U.S. Department of Agriculture.

USSR but also whetted consumer desire for further improvement. The findings, however, are not without implications for some public health issues. The relatively high level of calories and the rapid growth in the per capita level of fat may be related to changing Soviet mortality patterns, including the rapid increase in death rates from coronary heart disease among Soviet men of able-bodied ages. A high-fat diet has also been associated with some forms of cancer. Soviet medical researchers have also indicated some concern over the adequacy of some nutrients in the food supply available to certain groups, particularly children.

II. INTRODUCTION

Western researchers have paid considerable attention to the economic and political issues associated with the imbalances between the supply of and demand for animal products and other quality foods in the Soviet Union. Over the last two decades, growth in discretionary income and the maintenance of low and increasingly subsidized retail prices, along with greater awareness of the better availability and variety of foods in the West and in some East European countries, have pushed up Soviet consumer demand for high quality foods. Although the composition of the food supply has changed somewhat to reflect consumer preferences, the Soviet Union has not solved the economic problem of providing a food supply that matches consumer preferences.

Little research, however, has been devoted to a parallel but separate issue, the nutrient content of the Soviet food supply. The Soviet Union does not publish systematic data on per capita levels of calories and nutrients. Nor does it provide in any one source the sufficiently detailed breakdown of food availability by type necessary to do an accurate nutrient composition series. Undertaken as a contribution toward filling this gap in our understanding of Soviet consumer welfare, this paper presents the results of research conducted jointly by the Office of Soviet Analysis of the Central Intelligence Agency and the Human Nutrition Information Service of the US Department of Agriculture. Using a broad range of Soviet sources, the Office of Soviet Analysis prepared detailed data on per capita food availability consistent with USDA methodology. The Human Nutrition Information Service, which conducts the annual nutrient analysis of the US food supply, provided the technical analysis of this data.

This paper presents an estimate of the levels and sources of 21 nutrients in the food supply of the USSR and a comparison with those of the US food supply for the period 1965 to 1981. In order to assess levels and sources of nutrients in both the US and Soviet food supplies, per capita food supply data were employed. Food supply data represent amounts of food available for consumption measured either at the wholesale or retail level of the food distribution system. Food supply data do not indicate actual use by households or intake by individuals nor do they account for variations in the distribution of food among individuals. Food supply data are used to assess trends in food consumption and nutrient levels over time. In both countries—but especially in the USSR—the nutrients actually ingested by the population are less than the

nutrients available in the food supply because of both quantitative and qualitative losses that occur in processing, distribution, and food preparation subsequent to the point of measurement. The data represent average per capita per day nutrient levels and do not indicate the differences that exist among various regions and population groups; these differences likely are more pronounced in the USSR than in the United States. It should be emphasized that food supply data and recommended dietary allowances are not strictly comparable. Food supply data are estimates of nutrients on a per capita basis from food available at some point in the wholesale or retail chain and do not indicate actual use by households or intake by individuals. RDAs, on the other hand, are recommended levels of actual intake for healthy persons by sex-age groups. But to give the reader some frame of reference for gauging the adequacy of nutrients levels, RDAs are presented in this study.

Estimated quantities of foods and nutrients in the US food supply have been published by USDA dating from 1909. The consistent methodology used to develop these estimates was applied to USSR data (see appendix). Small methodological differences were noted in estimating nutrient levels for the two countries. Therefore, it may be more reliable to compare nutrient trends for each country than to compare Soviet and US levels of specific nutrients. Nevertheless, the derivation of the data for both food supplies is sufficiently similar that some general comparisons between the two food supplies are appropriate for the period 1965 to 1981.

III. CHANGES IN THE CALORIE AND NUTRIENT CONTENT OF THE SOVIET FOOD SUPPLY AND COMPARISONS WITH THE U.S. FOOD SUPPLY

Between 1965 and 1981 the per capita calorie level of the Soviet food supply increased by 6 percent, the protein level increased by 8 percent, and the carbohydrate level declined by 2 percent. Particularly striking was the 26-percent increase in the per capita daily level of fat and the 56-percent increase in cholesterol (table 1 and figure 1).

TABLE 1.—USSR FOOD SUPPLY: LEVELS OF NUTRIENTS AND FOOD COMPONENTS PER CAPITA PER DAY, SELECTED YEARS

	1965	1970	1975	1978	1980	1981
Food energy (calories)	3,060	3,180	3,220	3,270	3,260	3,250
Protein (grams)	91	98.6	98.6	99.9	98.3	98.2
Fat (grams)	82.1	89.6	100	102.5	103.7	103.3
Carbohydrate (grams)	499.8	505	491.1	496.6	492.1	490.6
Calcium (milligrams)	590	800	740	790	750	760
Phosphorus (milligrams)	1,530	1,700	1,650	1,670	1,630	1,630
Zinc (milligrams)	11	12	12	12	12	12
Iron (milligrams)	15	16	16	16	15	15
Magnesium (milligrams)	430	440	430	430	420	420
Thiamin (milligrams)	1.9	2	1.9	1.9	1.8	1.8
Riboflavin (milligrams)	1.7	2	2	2.1	2	2
Niacin (milligrams)	20	20	20	20	20	20
Folacin (micrograms)	255	270	265	265	265	265
Vitamin C (milligrams)	120	130	120	130	120	120
Vitamin A (International Units)	4,200	4,900	5,200	5,400	5,800	5,800
Vitamin B ₆ (milligrams)	2.1	2.1	2.1	2.1	2.1	2
Vitamin B ₁₂ (micrograms)	4.7	6	6.6	6.7	6.6	6.6

TABLE 1.—USSR FOOD SUPPLY: LEVELS OF NUTRIENTS AND FOOD COMPONENTS PER CAPITA PER DAY, SELECTED YEARS—Continued

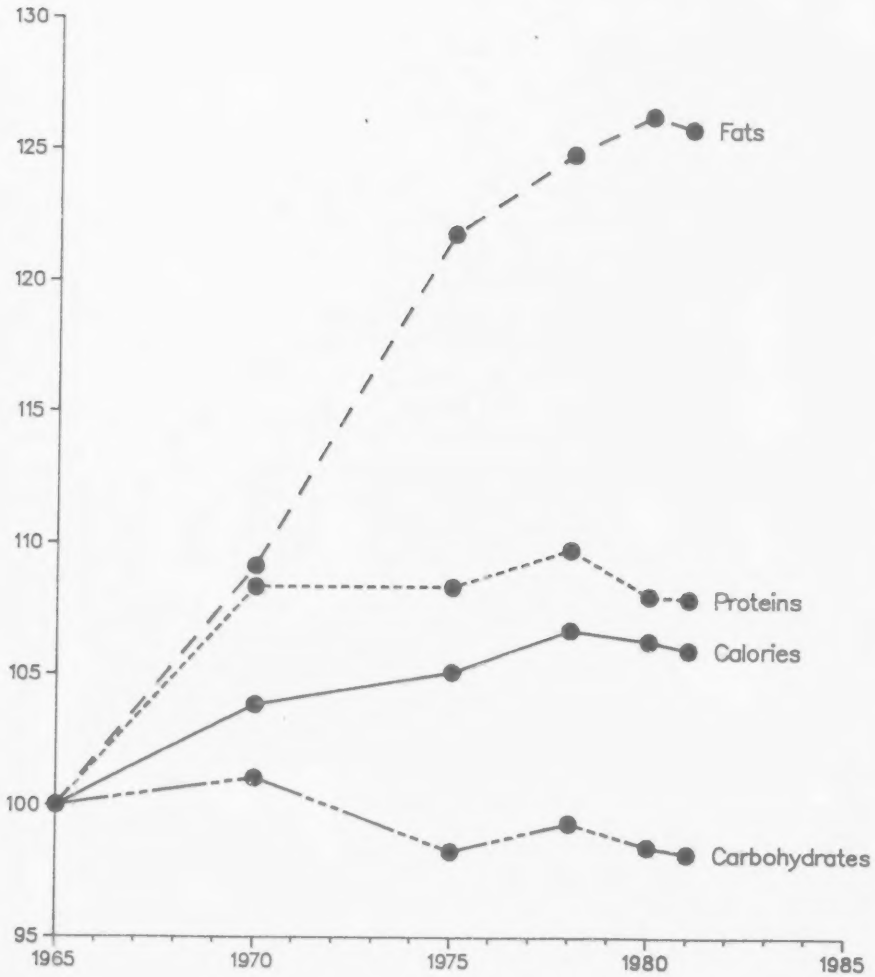
	1965	1970	1975	1978	1980	1981
Cholesterol (milligrams)	265.5	326.9	392	406	412.8	414.3
Total saturated fatty acid (grams).....	30	34	38	38	38	38
Oleic acid (grams)	23	26	29	30	30	30
Linoleic acid (grams)	19	18	21	22	22	23

Source: Nutrient data calculated by Human Nutrition Information Service, U.S. Department of Agriculture, based on data provided by Office of Soviet Analysis, CIA.

Figure 1

USSR Food Supply: Changes in Per Capita Levels of Calories and Nutrients, 1965-81

1965 = 100



The trends for the major nutrients in the Soviet food supply within the period studied also varied considerably. Most of the changes occurred in the 1965-75 period. The per capita level of calories rose through 1978 and then declined slightly in the final two years examined in the study, mostly as the result of decreases in the use of milk and milk products, grain products, and potatoes. The most rapid rise in the calorie level occurred during 1965-70. This period also accounted for nearly all of the rise in the protein level, which subsequently remained at the 1970 level with only small fluctuations, although the share of protein contributed by animal products continued to increase through 1980. The level of carbohydrates also increased in the 1965-70 period by a slight amount and then began to fall, also with some fluctuations. The level of fat held to a steadier pattern, rising through 1980 with only a minor decrease in 1981; it too, however, rose most rapidly in the early years of the study, 1965-75. The level of cholesterol rose throughout the period of the study, with the rise also being most pronounced in 1965-75. The higher rate of increase in the cholesterol level is accounted for primarily by steady and substantial increases in the availability of eggs, which are high in cholesterol content.

Per capita calorie levels exceeded Soviet recommended levels of ingestion for adults by over 200 calories in 1965 and by nearly 400 in 1981. The Soviet per capita calorie levels also exceed current US recommended allowances for adult men and women—allowances that are considerably lower than Soviet recommendations (table 2). Per capita levels of protein in the Soviet food supply for the period studied were within the Soviet recommended range of intake for adults. As with calories, Soviet per capita protein levels now nearly match US levels (table 1 and 3.) During the period covered by this study, the sources of protein in the Soviet food supply have changed markedly, with a greater share now coming from livestock products (figure 2). The share of protein in the food supply from livestock products has increased from one-third to nearly one-half—still well below the 70-percent share in the US food supply. Although the per capita level of carbohydrate in the Soviet food supply decreased by 2 percent over the period, it exceeded the US level of 391 grams per capita per day by 25 percent in 1981. While the per capita supply of flour, other cereal products, and potatoes was falling, the Soviet supply of refined sugar increased and was much closer to the US levels than in 1965.

TABLE 2.—US AND USSR: RECOMMENDED DIETARY ALLOWANCES FOR ADULTS ¹

	US	USSR ²
Calories:		
Men ³	2,400-2,900	2,850
Women ³	1,800-2,100	
Protein (grams):		
Men	⁴ 56	80-100
Women	⁴ 44	
Fat (grams):		
Men	NA	80-100

TABLE 2.—US AND USSR: RECOMMENDED DIETARY ALLOWANCES FOR ADULTS ¹—Continued

	US	USSR ²
Carbohydrate (grams):		
Men	NA	400-500
Women	NA	400-500
Calcium (milligrams):		
Men	800-1,200	800-1,000
Women	800-1,200	
Phosphorus (milligrams):		
Men	800-1,200	1,000-1,500
Women	800-1,200	
Zinc (milligrams):		
Men	15	10-15
Women	15	
Iron (milligrams):		
Men	10-18	15
Women	10-18	
Magnesium (milligrams):		
Men	350-400	300-500
Women	300	
Pantothenic acid (milligrams):		
Men	4-7	5-10
Women	4-7	
Thiamin (B ₁) (milligrams):		
Men	1.2-1.5	1.5-2.0
Women	1.0-1.1	
Riboflavin (B ₂) (milligrams):		
Men	1.4-1.7	2.0-2.5
Women	1.2-1.3	
Niacin (milligrams):		
Men	16-19	15-25
Women	13-14	
Folacin (micrograms):		
Men	400	200-400
Women	400	
Vitamin C (milligrams):		
Men	60	50-60
Women	60	
Vitamin A (International units):		
Men	5,000	5,000-8,000
Women	4,000	
Vitamin B ₆ (milligrams):		
Men	2.0-2.2	2.0-3.0
Women	2.0	
Vitamin B ₁₂ (micrograms):		
Men	3.0	2.0-5.0
Women	3.0	
Vitamin D (International units):		
Men	200-400	100-400
Women	200-400	

¹ Values for adults in the United States defined as 15-75 years. Definition of adults was not included in Soviet source. US Recommended Dietary Allowances (RDAs) are the levels of intake of essential nutrients adequate to meet the known nutritional needs of practically all healthy persons. Setting RDAs (except for energy) to ensure that the needs of nearly all in the population are met means that the allowances will exceed the requirements of most individuals. Soviet recommended nutritional levels are also made on this basis. Therefore, intakes below the recommended allowance for a nutrient are not necessarily inadequate, but the risk of having an inadequate intake increases as intake is reduced from the level recommended as safe.

² Assumed for average adult.

³ US recommended daily energy intake for adults given here are the midpoints of the ranges recommended for men and women. The ranges given here include the midpoints of the recommended daily energy allowances for men and women in the age categories of 15-18, 19-22, 23-50, and 51-75.

⁴ Based on recommended 0.8 gm of protein per kilogram of body weight and assumed body weight of 70 kg for men and 55 kg for women.

Sources: for the US, Committee on Dietary Allowances, Food and Nutrition Board, National Research Council, "Recommended Dietary Allowances," Ninth Revised Edition, National Academy of Sciences, Washington, D.C., 1980. The Committee on Dietary Allowances of the Food and Nutrition Board of the National Academy of Sciences periodically updates and reissues the authoritative "Recommended Dietary Allowances." For the USSR, USSR Academy of Medical Sciences, "Khimicheskiy sostav pishchevyykh produktov," Moscow, 1977.

NA—Not available.

TABLE 3.—US FOOD SUPPLY: LEVELS OF NUTRIENTS AND FOOD COMPONENTS PER CAPITA PER DAY, SELECTED YEARS

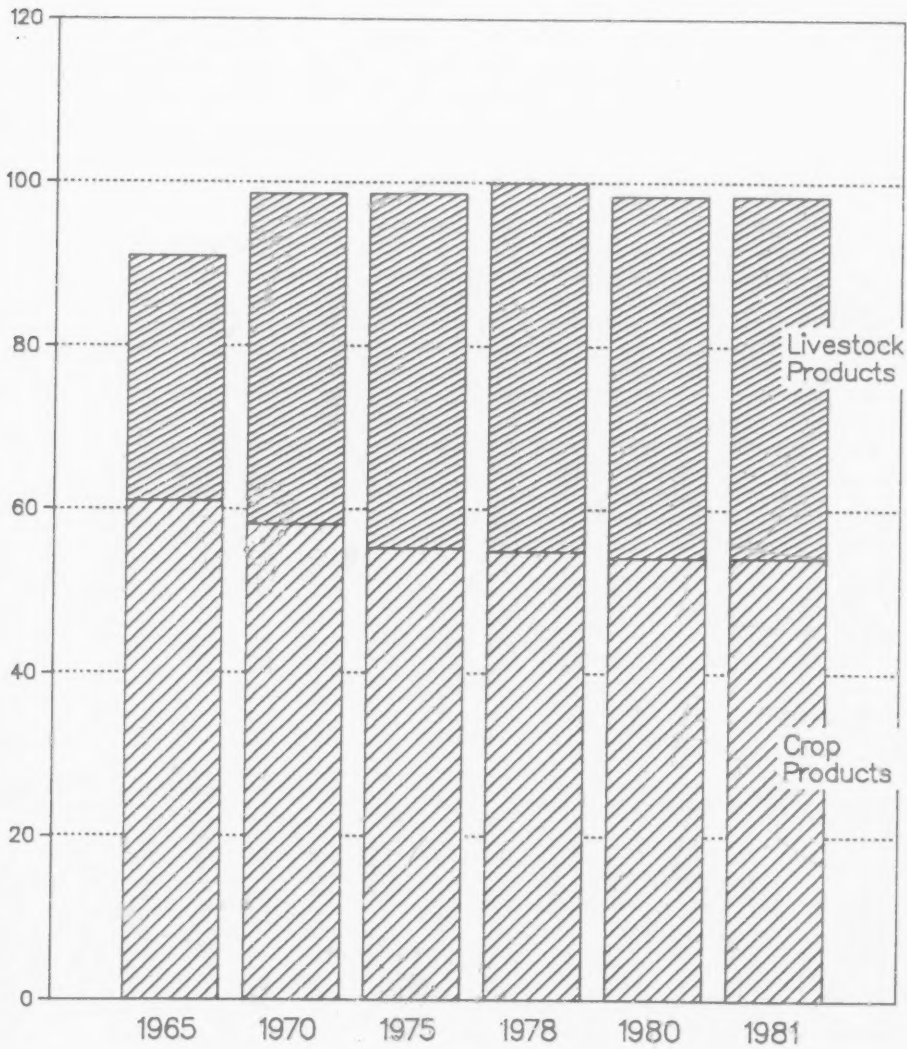
	1965	1970	1975	1978	1980	1981
Food energy (calories)	3,190	3,330	3,260	3,340	3,410	3,410
Protein (grams)	96	100	99	100	100	100
Fat (grams)	150	160	152	158	163	164
Carbohydrate (grams)	370	379	380	387	392	390
Calcium (milligrams)	920	900	870	880	900	870
Phosphorus (milligrams)	1,500	1,500	1,500	1,500	1,500	1,500
Zinc (milligrams)	12	12	12	12	12	12
Iron (milligrams)	16	17	17	17	17	17
Magnesium (milligrams)	330	340	340	330	330	330
Thiamin (milligrams)	1.8	2.0	2.0	2.0	2.2	2.1
Riboflavin (milligrams)	2.2	2.3	2.3	2.4	2.4	2.3
Niacin (milligrams)	22	24	25	26	26	26
Vitamin C (milligrams)	100	110	120	120	120	120
Vitamin A (International units)	7,500	7,900	7,800	7,700	7,600	7,700
Vitamin B6 (milligrams)	1.8	2.0	2.0	2.0	2.0	2.0
Vitamin B12 (Micrograms)	8.9	9.6	9.2	9.0	9.0	9.0
Cholesterol (milligrams)	523	526	484	487	490	486
Total saturated fatty acids (grams)	55	55	51	53	54	54
Oleic acid (grams)	61	66	62	63	64	65
Linoleic acid (grams)	18	22	22	24	25	26

Source: "Food Consumption Prices, and Expenditures, USDA." Stat. Bulletin No. 702 and unpublished data from USDA; Quantities of nutrients are computed by Human Nutrition Information Service, US Department of Agriculture, on the basis of estimates, prepared by the Economic Research Service, of per capita civilian food consumption (retail weight). No deductions are made in nutrient estimates for loss or waste of food in the home, use for pet food, or for destruction or loss of nutrients during the preparation of food. Data include estimates of home garden produce and iron, thiamin, niacin, and riboflavin added to flour and cereal products; other nutrients added primarily as follows: Vitamin A to margarine, milk of all types, flavored milk extenders; Vitamin B₆ to cereals, meal replacements, infant formulas; Vitamin B₁₂ to cereals; ascorbic acid to fruit juices and drinks, flavored beverages and dessert powders, flavored milk extenders, and cereals.

Figure 2

Protein in the Soviet Food Supply: Amounts Contributed by Crops and Animal Products

Protein per Capita per Day, Grams



The per capita levels of vitamins and minerals (with the exception of calcium) in the Soviet food supply for most of the period studied were at or exceeded Soviet or US recommended dietary allowances (RDAs) for adults. The per capita level of calcium did not reach either the Soviet RDA or the US RDA for the period studied, and was below that in US per capita food supply levels. The level of vitamin A, which remained below the Soviet RDA, was below the US RDA in 1965, improved significantly by 1970, and by 1975 exceeded the US RDA. It remained below US per capita food supply levels for the period. The per capita level of folacin was well below the US recommended allowance, but within Soviet recommended allowances for the period. The per capita level of riboflavin was at or above the US RDA for most of the period, but only reached the higher Soviet RDA in 1978. It remained below the per capita level of riboflavin in the US food supply for the period. The per capita level of zinc was within the Soviet RDA range but did not reach the US RDA during the period studied. Nonetheless, it was close to the per capita level of zinc in the US food supply for the period. Large differences in the per capita level of magnesium, niacin, and vitamin B₁₂ in the two food supplies should also be noted.

The per capita level of fat in the Soviet food supply increased by 26 percent over the period, from 82.1 grams in 1965 to 103.3 grams in 1981. The per capita level of cholesterol in the food supply increased by 56 percent, from 265.5 milligrams in 1965 to 414.3 milligrams in 1981.¹ Although these were rapid increases, especially when viewed against US patterns, per capita levels of fat and cholesterol in the Soviet food supply are still below US levels (figure 3).² Large increases in the Soviet per capita supply of meat, vegetable oil, and dairy products in 1965-81 are responsible for the sharp increase in per capita level of fat and cholesterol (tables 4 and 5). The share of calories from fat in the Soviet food supply (28 percent) in 1981 is still well below the US share (42 percent), but the gap narrowed since 1965, when the share of calorie intake from fat was 24 percent, and that in the US diet was 42 percent (figure 4).

TABLE 4.—FAT IN THE SOVIET FOOD SUPPLY: SHARES CONTRIBUTED BY MAJOR FOOD GROUPS

	[In percent]					
	1965	1970	1975	1978	1980	1981
Meat, poultry, fish	23.4	24.0	25.9	24.9	24.8	24.9
Eggs	2.4	2.9	3.5	3.6	3.7	3.8
Dairy products	14.7	21.0	17.5	18.5	17.4	17.3
Fats and oils (includes butter)	50.4	43.9	46.0	46.2	47.5	47.3
Noncitrus fruits	.3	.3	.3	.3	.3	.3

¹ Cholesterol, a fat-like substance, generally is produced by the human body in sufficient quantities to meet the body's needs, but it is also present as a natural component of diets containing foods of animal origin. It is necessary in the formation of several substances, such as vitamin D and hormones. Another important function is as part of the covering of nerve fibers.

² In the United States, the level of total fat in the food supply has increased about 30 percent since the beginning of the century, rising from 124.5 to 164 grams per capita per day from 1909-13 to 1981. The cholesterol level of the US food supply, however, has fluctuated considerably during this century. It reached its lowest level of 464 milligrams per capita per day in 1917 and again in 1935. Its peak level of 596 milligrams per capita per day occurred in 1945. Since then, the level of cholesterol in the food supply has fluctuated downward to 479 milligrams per capita per day in 1982. *National Food Review*, Winter 1984.

TABLE 4.—FAT IN THE SOVIET FOOD SUPPLY: SHARES CONTRIBUTED BY MAJOR FOOD GROUPS—
Continued

[In percent]

	1965	1970	1975	1978	1980	1981
Potatoes.....	.4	.3	.3	.3	.2	.2
Dark green/deep yellow vegetables.....	.1	.1	.1	.1	.1	.1
Other vegetables.....	.3	.3	.3	.3	.3	.3
Legumes and nuts.....	.5	.6	.6	.6	.5	.5
Grain products.....	7.6	6.6	5.6	5.3	5.2	5.2

Source: Nutrient data calculated by Human Nutrition Information Service, U.S. Department of Agriculture, based on data provided by Office of Soviet Analysis, CIA.

Note.—Numbers may not add to 100 because of rounding.

TABLE 5.—CHOLESTEROL IN THE SOVIET FOOD SUPPLY: SHARES CONTRIBUTED BY MAJOR FOOD
GROUPS

[In percent]

	1965	1970	1975	1978	1980	1981
Meat, poultry, fish.....	33.2	31.3	30.6	29.5	29.3	29.1
Eggs.....	36.9	38.5	43.6	44.8	45.8	46.8
Dairy products.....	16.0	20.3	15.5	16.2	15.1	15.0
Fats and oils (includes butter).....	13.9	9.9	10.3	9.5	9.8	9.2

Source: Nutrient data calculated by Human Nutrition Information Service, U.S. Department of Agriculture, based on data provided by Office of Soviet Analysis, CIA.

Note.—Numbers may not add to 100 because of rounding.

Figure 3

USSR and US: Levels of Fat in the Food Supply
1965, 1975, and 1981

Per Capita per Day, Grams

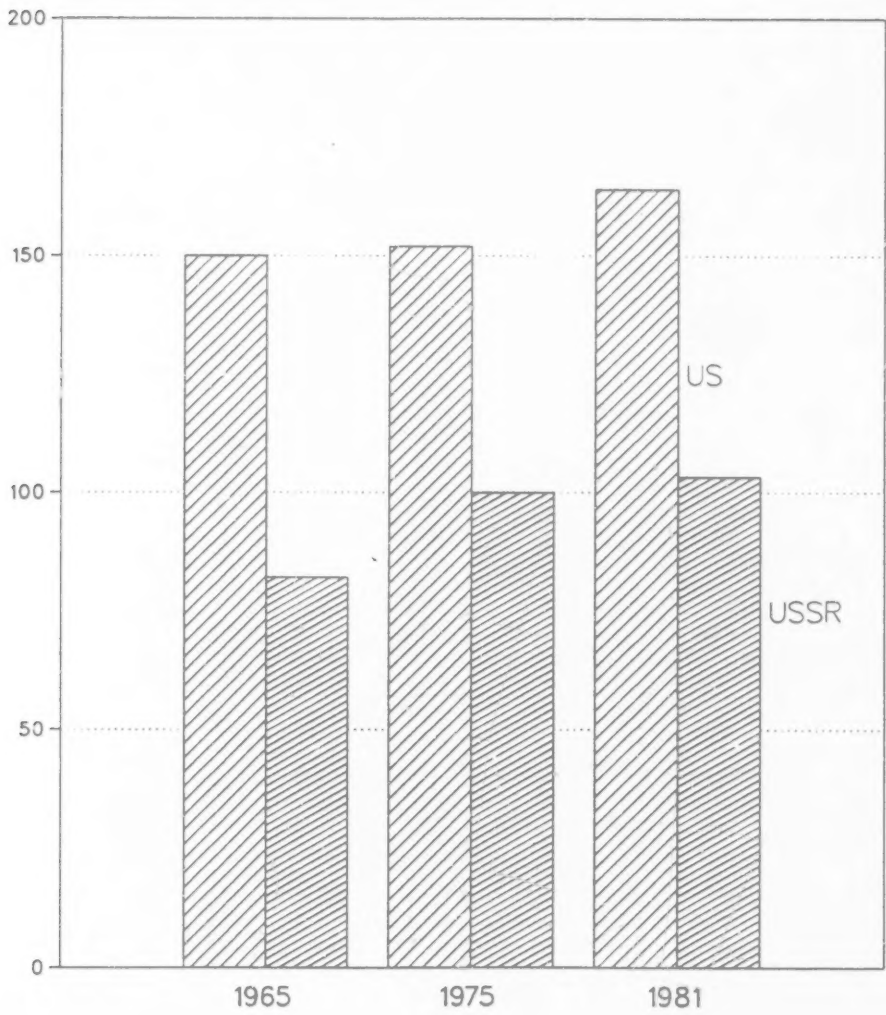


Figure 4

US and Soviet Food Supply: Sources of Energy (Calories)

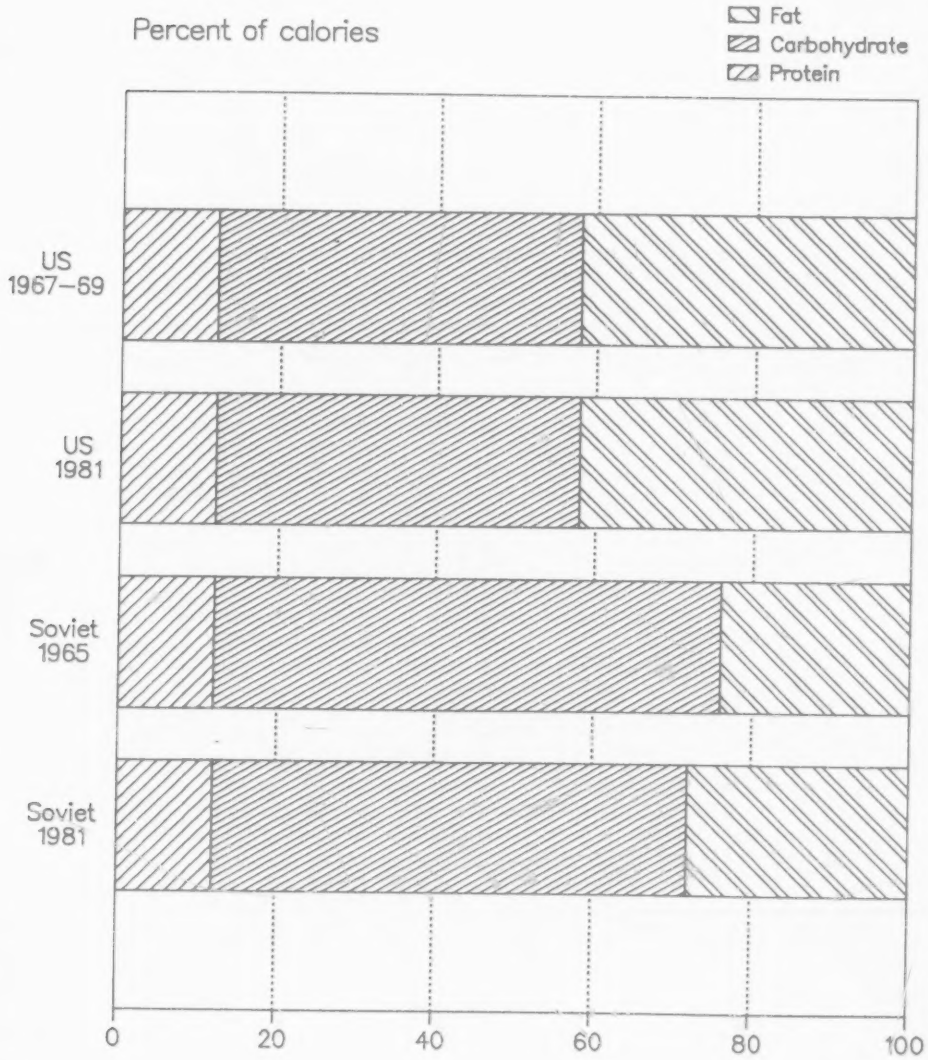
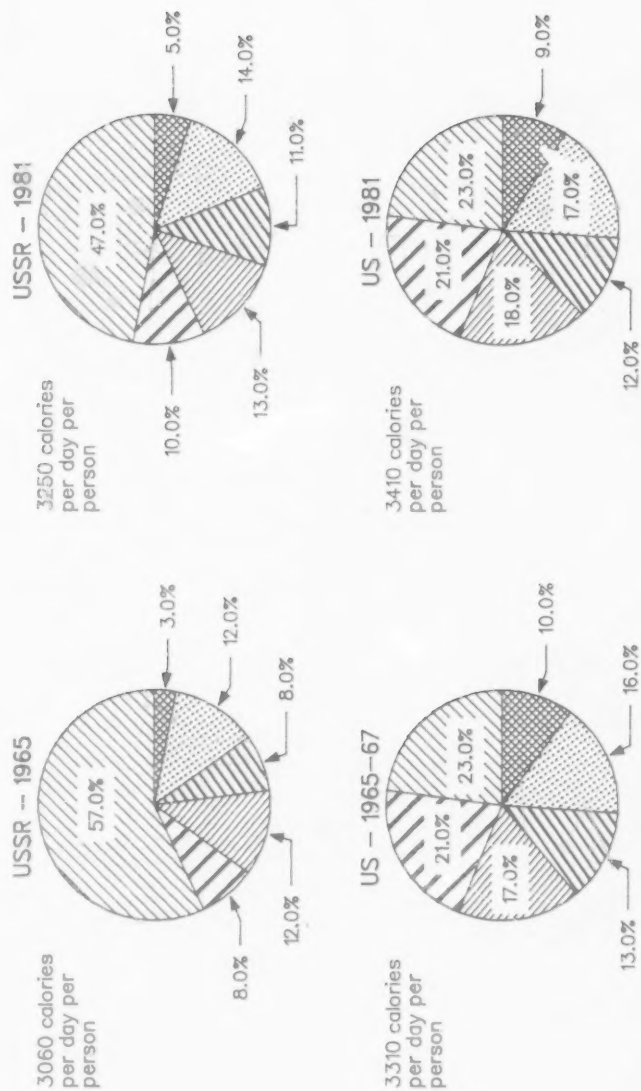
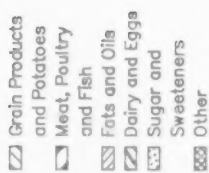


Figure 5

US and Soviet Food Supplies: Contributions by Major Food Groups



IV. CONSUMER SATISFACTION

The findings of this study indicate that the Soviet food supply on an average per capita basis has long been generally adequate from a nutritional point of view. These findings, however, do not mean that the consumer is satisfied with the diet. Nearly half of the calories in the Soviet food supply are provided by grain products and potatoes. (Figure 5) One-fourth of the calories are in this form in the US food supply. Over the last two decades, growth in discretionary income and the maintenance of low retail prices, along with greater awareness of the better availability of foods in the West and in some East European countries, have increased Soviet consumer demand for high-quality foods. Although the composition of the Soviet food supply has changed somewhat to reflect consumer preferences, the Soviet Union has not solved the economic problem of providing a food supply that matches consumer preferences. The imbalance between the supply of and demand for most livestock products and some other quality foods is manifested in queuing and black marketing.

V. DIETARY DEFICIENCIES

The postulation of some Western epidemiologists that the Soviet Union has in effect joined the "coronary life-style club," developing diet and other lifestyle-related trends in mortality and morbidity that have occurred earlier in more affluent societies, is well known.³ US and Soviet scientists have cooperated in research projects on the relationships between diet and coronary heart disease.⁴

Less discussed in scholarly literature are issues involving dietary deficiencies. A finding of average per capita levels of nutrients above the RDA for a large population does not, of course, provide information about the distribution of food and nutrients among population groups or individuals and therefore does not rule out the possibility that certain groups within a population are receiving inadequate amounts of certain nutrients.⁵ Indeed, Soviet medical literature indicates that nutritional deficiencies exist among

³ See Richard Cooper, M.D., and Arthur Schatzkin, M.D., M.P.H., "Recent Trends in Coronary Risk Factors in the USSR," *The American Journal of Public Health*, May 1982, Vol. 72, No. 5; Richard Cooper, M.D., "Rising Death Rates in the Soviet Union," *The New England Journal of Medicine*, 304; No. 21, 1981; John Dutton, Jr., "Changes in Soviet Mortality Patterns, 1959-1977," *Population and Development Review*, 1979, No. 5.

⁴ Joint US-USSR research in exploring some of these relationships has resulted in the following publications: US-USSR Steering Committee for Problem Area I: The Pathogenesis of Atherosclerosis. "Collaborative US-USSR study on the Prevalence of Dyslipoproteinemias and Ischemic Heart Disease in American and Soviet Populations," *American Journal of Cardiology*, 1977; 40:260-8; US-USSR Steering Committee for Problem Area I (The Pathogenesis of Atherosclerosis): Population Descriptions and Methodology for the Collaboration in Problem Area I. In: USA-USSR First Lipoprotein Symposium: Leningrad, USSR May, 26-27, 1981. Bethesda, MD: US Department of Health and Human Services, 1982, NIH Publication No. 83-1966; and US-USSR Steering Committee for Problem Area I: The Pathogenesis of Atherosclerosis. Nutrient Intake and its Association with High-Density Lipoprotein and Cholesterol in Selected US and USSR Subpopulations," *American Journal of Clinical Nutrition*, 1984; 39:942-952.

⁵ In the United States, for example, the first Health and Nutrition Examination Survey (NHANES), conducted in 1971-74, found dietary deficiencies among certain groups. Among the deficiencies, iron was the most frequent, affecting particularly young children and women of child-bearing age. The survey collected data through dietary surveys, physical examinations, and clinical tests.

some subgroups in the populations and that, in some cases, these nutritional deficiencies have led to deficiency diseases.

Soviet medical literature suggests, for example, that the prevalence of rickets (a vitamin D deficiency disease)⁶ among children, especially infants—particularly in the southern and Central Asian republics—may be considerably greater than in the United States, where it was virtually eliminated decades ago.⁷ The Soviet literature also suggests that nutritional anemia among children is common in some areas.⁸

For example, in early 1981 a pediatrician in Kazan' (in the Russian republic) stated that, although rickets "has lost the features of a social illness" in the Soviet Union, this problem "nevertheless continues to trouble pediatricians and attract the attention of researchers."⁹ Additional evidence of rickets and anemia in children in both cities and rural areas has surfaced.¹⁰ Taken together, this

⁶ Although rickets can be caused by other factors, it is most often caused by a vitamin D deficiency. In the absence of vitamin D, mineralization of bone matrix is impaired, resulting in rickets in children and osteomalacia in adults. The exact requirement for vitamin D has not yet been established. Although vitamin D can readily be formed by the action of sunlight on the skin, the amount formed is dependent on a number of variables, including length and intensity of exposure and color of skin. (*Recommended Dietary Allowances*, Ninth Revised Edition, National Academy of Sciences, Washington, D.C., 1980) In some northern areas of the USSR, children are provided with ultraviolet light treatments to prevent rickets.

⁷ While some pediatric texts now label rickets as a pediatric relic in the United States, it continues to be seen in the pediatric age range among certain susceptible subgroups, that include very premature infants, those on long-term anticonvulsant therapy, those with malabsorptive diseases, and some strict vegetarians with a little or no vitamin D intake. In 1927, it was discovered that the plant sterol ergosterol acquired the property of curing rickets when irradiated with ultraviolet light. This compound, ergocalciferol (called Vitamin D₂), has been added to almost all milk sold in the United States and Western Europe and has been responsible for the almost complete disappearance of rickets in the United States over the past 40 years. "Vitamin D Deficiency Rickets in American Children," *Comparative Therapy*, July 1981.

⁸ Although many nutrients are involved in the production of red blood cells and hemoglobin, iron deficiency is by far the most common cause of nutritional anemia all over the world. In certain sections of a population, especially pregnant women, folate deficiency is also an important cause. Even in developed countries certain sections of the population, such as premature infants, preschool children, and pregnant women, are particularly at risk; in developing countries the problem is much more widespread and serious. *Bulletin of the World Health Organization*, No. 56 (5), 1978. In the United States, the Ten-State Nutrition Survey revealed that, for children under 36 months of age, iron was the only nutrient for which mean intakes were generally below recommended daily allowances. (USDHEW, 1972) The first NHANES survey has provided additional evidence of intakes below the recommended daily allowances at all income levels and among all races. *The American Journal of Clinical Nutrition*, June 1978.

⁹ "Reshennye i nereshennye voprosy rakhita," *Pediatrics*, No. 2, 1981.

¹⁰ A study published in 1982 of the "actual diet and health status" of children in Kazakhstan reported the following: "Various forms of nutritional disturbances and diseases caused by them were found. The most widespread finding was a shortage of essential amino acids—lysine, methionine, and threonine—and vitamins A, C, and the B group. Rickets, hypotrophy, anemia, and obesity were often encountered among the diet-related diseases. A direct correlation was established between incidence of diseases, in which the nutritional factor is dominant, and infectious-inflammatory diseases that are the greatest cause of child mortality." *Vestnik Akademii meditsinskikh nauk SSSR*, No. 11, 1982. A study of child mortality for 1974 in Azerbaijan noted that a "rather high child mortality affects the republic's general mortality rate" and blamed poor medical care, specifically "weak prophylaxes for rickets." *Azerbaijanskiy meditsinskiy zhurnal*, No. 9, 1976. A study in Kazakhstan in the early 1980s of the physical development and general health of babies fed on different infant formulas, using breast-fed babies as controls, found that 12 percent of the breast-fed babies developed "diseases of the endocrine system, nutritional and metabolic disorders including rickets," and that 25 percent developed "alimentary anemia." Of the infants fed on formulas, the percentages developing the first category of problems ranged from 11 to 42 percent; no further figures were given for anemia. (*Zdravookhraneniye Kazakhstana*, No. 2, 1983) In a study conducted in the mid-1970s of 3,016 families in Leningrad with children up to 7 years of age, 450 families were found with children suffering from chronic illnesses; of these children, 8.6 percent suffered from "rickets and hypertrophy." (*Zdravookhraneniye Rossiyskoy Federatsii*, No. 8, 1979) In a study conducted of the medical records of 514 children up to age 3 who had died in the city of Sumgait in Azerbaijan in 1970-72, rickets was retroactively diagnosed in over 100 cases; the researchers believed that rickets was a significant contributing cause of death in many of these cases. In seven cases, anemia was diagnosed as the

Continued

material suggests that these deficiency diseases were occurring in the 1960s and 1970s and are still occurring in some regions in the USSR. The Soviets do not publish information on incidence of those diseases.

Rickets in infants may result from the inadequate supply of infant formula, the lack of supplemental Vitamin D for nursing infants, and insufficient exposure to sunlight.¹¹ Among older children, it may result from insufficient exposure to sunlight in combination with inadequate intake of food products containing Vitamin D.

SOVIET CONCERN OVER NUTRITIONAL INADEQUACIES

Soviet nutritional researchers have found the intake of various vitamins and minerals to be inadequate among other population and age groups in certain regions. The concern among Soviet medical authorities was clear at an all-union conference on nutrition sponsored by the Presidium of the Academy of Medical Sciences in late 1981. The report of the conference stated that, "Despite significant progress in rationalizing the diet, the problem of an insufficient supply of certain vitamins to selected groups in the population remains serious. Studies of various occupational groups among the population in a number of regions in the country have revealed insufficient intake of ascorbic acid, thiamin, riboflavin, and niacin." The conference recommended more research on the intake of vitamins A, C, B, B₂, D, E, and folacin among preschool and school-age children, older students, pregnant and nursing women, and certain unspecified occupational groups in Siberia, Central Asia, the Far East, and the North.¹² Soviet medical journals regularly discuss the problem of anemia in women of child-bearing age, suggesting that it is a widespread problem.

Differences in the intake of various nutrients leading to nutritional inadequacies among certain subpopulations have many causes. A major factor is the substantial variation in availability of various food products and per capita food supply levels among regions in the USSR. The Ukraine and Byelorussia have the highest per capita calorie levels with the Central Asian republics trailing well below the average levels for the USSR. The differences can be attributed to income levels, preference (which varies among ethnic groups), climate (calorie requirements tend to be somewhat less in southern regions), age structure (per capita calorie levels are lower in groups with higher proportions of infants and children), and regional differences in production. For example, in 1975, per capita use of meat (including poultry) in Estonia was 80 kg, with per capita production at 115 kg, while in Uzbekistan per capita use was 31 kg, with per capita production at only 18 kg. In 1981, the per capita use of fruit in the Siberian area of the Russian republic was

cause of death. *Azerbajdžanskiy meditsinskiy zhurnal*, No. 4, 1975. A medical examination of children in ten cities of the USSR conducted in 1969-71 found a large number of chronic diseases requiring treatment, including rickets and anemia. (*Pediatrics*, No. 2, 1980)

¹¹ Soviet mothers often use cow's milk or powdered milk reconstituted with water to feed their infants. Most milk and milk products in the Soviet Union are not fortified with vitamin D. Infant formula is still not produced in needed quantities in the Soviet Union, although much progress has been made.

¹² The conference report complained that "not enough" was being done to carry out earlier party-state and ministerial decrees on food fortification. *Voprosy pitaniya*, No. 4, 1982.

12 kg, while in the Russian republic as a whole per capita use of fruit was 40 kg.¹³ In addition, the marked seasonal fluctuations in the availability of certain foods, in large part a result of marketing and distribution problems, may cause significant variations in the food supply levels of some nutrients. Fresh vegetables and fruit are often unavailable for purchase in the winter and early spring. Researchers from the Institute of Nutrition, USSR Academy of Medical Sciences, are beginning to study the effects of these seasonal variations.¹⁴

The effects of the regional and seasonal variations on intake of certain foods among population subgroups could be ameliorated if food were more evenly distributed or if foods were enriched. Although a joint party-state resolution issued in 1960 ordered systematic enrichment of several basic foodstuffs, very little is being done. For example, only a tiny share of industrially processed milk in the Soviet Union is fortified with vitamin D. Soviet authorities, not unaware of the importance of food enrichment, plan large increases in the output of enriched food products, especially for children.

APPENDIX.—METHODOLOGY

This study was structured to examine the nutrient content of the Soviet food supply and to facilitate comparison with measurements of the nutrient content of the US food supply. Every effort was made to array information on the Soviet diet in a manner consistent with the methodology employed by the Human Nutrition Information Service of the US Department of Agriculture.¹

THE US FOOD SUPPLY

US food supply data prepared by the Economics Research Service of USDA represent the amounts of food that "disappear" into the food distribution system. They are derived by deducting data on exports, military use, year-end inventories, and nonfood use from data on production, imports, and beginning-of-the-year inventories. Because of the complexity of the food distribution system, consumption is variously measured at different stages of processing and distribution, from the raw or primary state to the retail product. Food losses that occur subsequent to the point of measurement (i.e., variously in processing, marketing, and home use) are not taken into consideration.² Therefore, estimates of the nutrient content of the US food supply are not intended to measure actual food ingestion by specific age-sex groups, but rather to serve as a valuable tool in assessing long-term trends in food and nutrient levels.

¹³ *Ekonomika i organizatsiya promyshlennogo proizvodstva*, No. 6, 1982; *Narodnoye khozyaystvo RSFSR v 1981g. Statisticheskii yezhegodnik*, Moscow, *Isentral'noye statisticheskoye upravleniye RSFSR*, 1982.

¹⁴ *Voprosy pitaniya*, No. 3, 1983. Nutritional sciences are under the responsibility of the Academy of Medical Sciences (AMS) of the USSR. This academy is governed by a presidium whose members comprise the elite of Soviet medical sciences. There are numerous medical research institutes under the control of the AMS. Among the AMS institutes is the Institute of Nutrition in Moscow, which is the central and lead institute for all nutrition research in the USSR. The Institute of Nutrition has a branch located in Alma Ata, Kazakhstan.

¹ More highly aggregated data on Soviet food consumption is used by the United Nations Food and Agriculture Organization in its production yearbook. The FAO methodology, which estimates per capita intake of 12 nutrients, has produced some results that differ from the CIA-USDA study; caloric consumption, for example, is estimated by the FAO to be considerably higher. Using FAO data, the World Bank calculated the per capita per day level of calories in the USSR in 1981 to be 30 percent above the per capita recommended dietary allowance. World Development Report 1984.

² A detailed explanation of the methodology for calculating the per capita nutrient content of the US food supply has been published. USDA Economic Research Service, *U.S. Food Consumption: Sources of Data and Trends*, Stat. Bulletin No. 364, 1965.

THE SOVIET FOOD SUPPLY

The measurement of the Soviet food supply is also based on the "disappearance" concept, that is, the amount of food disappearing into the food distribution system. Our data development on the Soviet food supply began with Soviet statistics on per capita consumption of 10 general categories of food products. This data to a large extent represents food in unprocessed form. These Soviet data were cross checked (as far as data allowed) for consistency between quantities available for human consumption on the one hand, and production, net trade, and other end uses on the other hand. These consumption data, in kilograms or other physical units, have been published regularly since 1965.³ They are based on a variety of sources, principally on balances of the supply and uses of agricultural products and on periodic family budget surveys. While the latter have been criticized by other Soviet sources for lack of representativeness, the results they give, according to Soviet statements, are checked against availabilities given by the product balances. Consumption of some food items—honey, tea, and margarine—not included in the 10 categories of food were developed from Soviet production and trade data.⁴

Although the absolute levels of food availability in any one year must be used with great care in international comparisons because of definitional problems (which were addressed in subsequent steps in our data development), the data are considered reliable indicators of trend. They are reasonably consistent with statistics for production, intermediate uses, changes in inventories, and net imports. Some data series, however, may be less reliable than others. For example, potatoes and vegetables, large shares of which are produced by the private sector and which are used for animal feeds, are more difficult to check for consistency between production and their various uses.

ACCOUNTING FOR LOSSES IN THE SOVIET FOOD SUPPLY

Soviet methodology in calculating food balances accounts for losses at some stages subsequent to harvesting.⁵ Discounts are made for losses on the farm during initial processing, storage, and further processing (if such processing takes place in an enterprise on the farm). Soviet-calculated balances, however, generally do not take account of losses that occur between delivery of products from the farm to other enterprises or losses that occur in off-farm processing. Because our methodology, wherever possible, converted Soviet data given in terms of unprocessed foodstuffs to an industrially processed basis, some of the losses during manufacturing were captured. Soviet data on food balances also incorporate at least partial allowances for the household feeding of bread, other grain products, and several other foods to privately owned livestock, as well as for some food waste that takes place in the home.

Because some losses in transport and processing are the result of theft rather than spoilage (and thus remain a component of food consumption), we did not apply further across-the-board discounts for food losses. Genuine losses of food do, of course, occur in the Soviet transport and manufacturing systems, but we have provided no general across-the-board adjustment for these. The impact of the resulting error on our estimate of the Soviet food supply in terms of the US measurement concept is offset to some small extent by the adjustment present in Soviet data for household losses—an adjustment not made in calculation of the US food supply.

No adjustments could be made, however, for the nutrient losses in fresh foods arising from poor Soviet storage procedures. To some extent, however, our inability to discount for nutrient losses in storage was at least partially offset, because no upward adjustments were made for the limited enrichment of foods that takes place in the Soviet Union.

OTHER ADJUSTMENTS TO DATA

Particular attention was paid to the necessity of discounting and/or adjusting Soviet data to account for processing practices different from those in the United

³ The method of calculating the physical measures of per capita consumption is described in *Vestnik statistiki*, No. 2, 1968, pp. 46-50. The more detailed methodology for calculation of consumption data by the Central Statistical Administration is set forth in "Instruktsiya po raschetu fondov potrebleniya naseleniyem oblastey, krayev i ASSR," *Upravleniye balanso narodnogo khozyaystva*, Moscow, 1972.

⁴ Vegetable oil consumed in margarine is not included in Soviet per capita consumption statistics.

⁵ Harvesting losses consist of output left in the field at harvest time or lost in transporting the harvested output to the point of weighing or recording. These amounts are not recorded as gross output.

States. Soviet technical handbooks and industry serial publications were used to obtain the specific information necessary for these detailed calculations. For example, Soviet data on per capita whole-milk availability had to be adjusted downward because much of the nutritionally valuable byproducts of butter and cheese production included in this data actually is discarded or used for animal feed. Similarly, official Soviet statistics on meat consumption had to be adjusted to account for the slaughter-fat included in these statistics, so these amounts would be counted as fat, not meat.⁶ Additional adjustments were made for edible offals included in Soviet meat consumption statistics so that their specific nutrient values could be included. Margarine consumption was adjusted downward to account for animal fat used in its production (to avoid double counting of animal fats included in the animal fat category.) Slaughter fat from cattle was adjusted downward to account for production of tallow.

In addition, because Soviet food-use numbers for most categories of foods are given in terms of fresh, unprocessed equivalents (even though some food is purchased by the consumer in processed form), it was necessary to recalculate the amounts of food available for consumption in fresh form. Soviet food processing is generally less efficient than in the United States, using more raw material per unit of output. Therefore, reported industrial output for as many food products as possible was located, and the amounts of various unprocessed foods required to produce these processed foods were calculated (taking account of the lesser Soviet efficiencies). Amounts of processed foods were included in per capita consumption; the amounts of unprocessed foods required to produce processed foods were then subtracted from the Soviet-presented food use numbers to obtain the food amounts actually available to the consumer in unprocessed form.

It was necessary to develop disaggregated data for each year covered by the study. The operating principle was that greater specificity in the data would reduce the likelihood of errors in the calculation of nutrient content. Such data included the shares of processed and fresh foods in certain categories and the proportions of the specific foods in each basic category. For example, the various types of fish and seafoods included in the general category of "fish" and the various types of flour included under the general category of "flour and other grain products" had to be determined. Then, as much as possible, item-specific data were developed or estimated; for example, quantities of milled wheat products in the food supply in the form of flour or groats were estimated. Each food item was then described in as great a detail as possible so that nutrient values specific to that food could be assigned. For example, the various types of fish and the quantities sold whole, dressed, and filleted were estimated. When specific data could not be located—for example, oranges by varietal type—the procedure was to assign average nutrient values for all types that might be expected to be used in the USSR.

Following USDA practice, commercially produced alcohol and the grain and sugar used in alcohol production were not included in the food supply. No adjustments were made to Soviet food supply data for diversion of food products into homebrewed and home-distilled alcoholic beverages, although the extent of such diversion is probably larger in the USSR than in the United States.⁷ This decision was made

⁶ Slaughter fat as a percentage of slaughter weight without the hide is 5 percent for beef, 12 percent for pork, 8.5 percent for mutton and lamb, and 5 percent of the "other" category, which includes rabbit, horse, and reindeer. Poultry consumption was broken down by type and fat content was calculated by type of poultry.

⁷ In the USSR, alcohol consumption per person 16 years and older, if Soviet statistics on alcohol consumption are used, amounts to 130–140 calories per day. Vladimir G. Trembl, in *Alcohol in the USSR: A Statistical Study* (Durham, N.C.: Duke University Press, 1982) has calculated amounts of pure alcohol consumption per person 15 years and older for a series of years. Using these estimates, the amount of alcohol consumed (excluding home-made wine and beer) would equate to 220–230 calories per day per person 16 years and older in 1979. These amounts include some distilled spirits illegally produced in households from foods included in per capita consumption of food. Sugar, sugar beets, grain, flour, bread, and potatoes are used in the illegal production of distilled spirits. Trembl believes that the illegal production of distilled spirits results almost entirely from the use of refined sugar. Using the high end of the range for the amount of sugar Trembl estimates is used to produce distilled spirits in households, we estimate that about 7 kg of sugar per capita could have been diverted from the food supply at the household level that year. This amounts to 75 calories per day per capita, or slightly over 2 percent of the per capita per day calorie level for 1978 and 1980 calculated by the CIA-USDA study. Because the estimates of the consumption of illegally produced distilled spirits are subject to considerable uncertainty and because the estimates of materials used in that portion of alcohol consumption arising from illegal production are subject to even more uncertainty, the net impact upon nutrient levels cannot be calculated with reasonable certainty. For example, if one were to

Continued

in accordance with the standard USDA practice of not applying discounts for losses occurring after the stage of processing and distribution at which food supply measurements are made.

Use of Soviet-derived nutrient values for the various foodstuffs was considered, but many unexplained differences in nutrient data were found.⁶ These differences could not be attributed to measurement inconsistencies or to varietal and production differences. Nor were data available for all foods and nutrients. Therefore, in this study, the nutrient values for foodstuffs are those used by the USDA Human Nutrition Information Service. Food composition data were based on chemical analysis of food available in the United States, adjusted to take into account specific descriptions of Soviet foods. Discounts are made for refuse, such as bone in meat and fish, and rinds, peelings, pits, and seeds in fruit.

assume that potatoes rather than sugar were the major raw material used in illegal household production of distilled spirits, the level of ascorbic acid and some other vitamins not present in sugar would decrease in the food supply. If one were to assume sugar beets were the primary raw material used, then no nutrient loss would occur, because sugar beets (unlike table beets) are considered to be a "technical crop," are used in the industrial production of starch and sugar, and are not counted as part of the food supply. In the United States, consumption of alcohol per person 15 years and older amounted to between 180 and 190 calories per day (not including nontaxed production of alcoholic beverages) in 1979.

⁶ USDA Agricultural Research Service Agriculture Handbook (and subsequent revisions), No. 8, *Composition of Foods*, 1963, and USSR Academy of Medical Sciences, *Khimicheskiy sostav pishchevykh produktov, pishchevaya promyshlennost'*, Moscow, 1977.

RAISING THE EFFICIENCY OF SOVIET FARM LABOR: PROBLEMS AND PROSPECTS

By Ann Goodman,* Margaret Hughes,* and Gertrude Schroeder**

CONTENTS

	Page
Summary	100
I. An Overall Perspective	101
II. The Agricultural Labor Force.....	106
III. Why Productivity Is Low	106
A. Pay Is Not Sufficiently Linked to Performance	107
B. Machinery Has Not Been an Effective Substitute for Labor	109
C. Retaining Skilled Workers Is Difficult	109
D. Rural Living Standards Are Low	110
E. Rural Education Programs Are of Low Quality.....	111
F. The Rural Population Is Aging	111
IV. Efforts To Cope in the 10th and 11th Five Year Plan Periods.....	112
A. Measures Taken	112
B. An Assessment of Progress in 1983-86.....	118
V. Initiatives for the 12th Five Year Plan Period.....	120
VI. Outlook	122

SUMMARY

The low productivity of the USSR's vast farm labor force has kept demand for farm labor high and has markedly slowed the transfer of labor from agriculture to industry. The extraordinarily large expenditures of labor in Soviet agriculture cannot be attributed to a lack of investment or to failure to raise farm wages. Attention from the government has been lavish in these areas in recent decades, but the productivity payoff has been small.

Since 1975, a large number of decrees have been issued and other measures taken in a many-sided effort to improve the productivity and regional distribution of the farm labor force. In summary, the measures amounted to: making minor adjustments to the existing system of wages and bonuses; allocating more investment funds for rural housing, roads, and other infrastructure as well as for the agricultural machinery industry; offering non-monetary incentives to attract skilled workers to agriculture; encouraging workers in areas of surplus labor to settle in areas of labor shortages; and finally, attempting to implement widespread use of the collective contract system of labor organization. By the beginning of the 12th Five Year Plan period, however, these measures had not provided the expected productivity gains.

* Office of Soviet Analysis, Central Intelligence Agency.

**Professor of Economics, University of Virginia.

The Gorbachev regime appears to be continuing with past strategies, in the apparent belief that lack of effective implementation has been the chief barrier to success. In particular, Gorbachev is relying on more investment in rural housing and infrastructure to keep younger, skilled workers on farms. At the same time, more investment in production facilities and strict quality control are to result in better farm machinery which, in turn, will reduce the inordinately large demand for manual labor on farms. Most important, however, Gorbachev is counting on more effective implementation of collective contracts with small groups of farm workers coupled with self-financing, to raise productivity and financial accountability on farms.

Realization of Gorbachev's ambitious plans to accelerate economic growth requires, among many other things, that the burden of the resource-intensive farm sector be reduced. The programs now in place, however, do not seem equal to the task of providing a "radical breakthrough" in the productivity of farm labor over the next few years. First, the program to improve rural living conditions is likely to founder on the shoals of too little investment. Rural life is hardly likely to become more appealing to the best and brightest of rural youth over the next few years. Second, the modernization of farm machinery—a lengthy process under the best of circumstances—will be hampered by the lack of effective economic ties between farms and machinery producers and between them and their suppliers of raw materials and component parts. Finally, collective contracts and self-financing will not generate large productivity gains as long as they must be carried out in a context of fixed plans and administered prices for farm production and for inputs to be used in the production process.

I. AN OVERALL PERSPECTIVE

Employment in Soviet agriculture has declined slowly in comparison with that in other industrialized countries and the rate of decline has slowed markedly in the past decade. In 1985, the farm sector in the USSR still accounted for over one-quarter of total employment—a share even greater than that in Bulgaria. Shares of employment in agriculture vary widely among the union republics, however, ranging from a low of 17 percent in the RSFSR to over 30 percent in several of the Central Asian republics. Countries such as Japan and Italy, which had employment patterns similar to those of the USSR in 1950, have experienced a much more rapid decline in agricultural employment (table 1). Thus, the transfer of labor from farms to industry has contributed much less to economic growth in the USSR than in the West and this contribution has been deteriorating.

TABLE 1.—EMPLOYMENT IN AGRICULTURE AS A SHARE OF TOTAL EMPLOYMENT ¹

	[In percent]				
	1950	1970	1975	1980	1985
Japan	51.6	17.4	12.7	10.4	8.7
Italy	43.9	18.2	15.2	13.2	11.2
United States	12.1	4.5	4.1	3.6	3.1
USSR	53.9	32.2	28.8	26.4	25.4

¹ Data for the US, Italy, and Japan include agriculture, forestry, and fishing. For the USSR, employment in forestry has been added to total employment in agriculture to make the measure for the USSR comparable to those for the other countries. Data for fishing are not available.

Sources: USSR: Stephen Rapaw, "Civilian Employment in the USSR, 1950-83," US Department of Commerce, Bureau of the Census, Center for International Research, CIR Staff Paper No. 10, August 1985. Data for 1985 are unpublished estimates of the author.

Japan: "Japan Statistical Yearbook," 1966, p. 54. ILO, "Yearbook of Labor Statistics," 1983 and 1986.

Italy: ILO, "Yearbook of Labor Statistics," 1968, 1983, and 1986.

US: "US Statistical Abstract," 1975; ILO, "Yearbook of Labor Statistics," 1983 and 1986.

The productivity of the vast Soviet farm labor force is low. Although Soviet statistics put labor productivity at 20-25 percent of that in the US, Western measures put it at only 10 percent. Western research has shown that Soviet agriculture uses far more workers per hectare than US agriculture. Able-bodied men per hectare in the USSR far outnumber those in the US.¹ Because the productivity of this large labor force is so low, however, Soviet agriculture experiences labor shortages and has made increasing use of temporary seasonal help (figure).

¹ D. Gale Johnson and Karen McConnell Brooks, *Prospects for Soviet Agriculture in the 1980s*, Indiana University Press, 1983, p. 166. The authors base their conclusions on data from the 1970 census. The 1979 census was not published in detail sufficient to make comparable calculations for that year.

Figure
USSR: Sources of Labor in Agriculture*



*Derived from statistics on total manhours in agriculture. The source of these statistics is described in Table 3.

The extraordinarily large expenditures of labor in Soviet agriculture are largely responsible for the fact that, in climatically similar areas, the productivity of all resources employed in Soviet agriculture is only about half of productivity in US agriculture.

The fact that labor requirements in Soviet agriculture have remained extraordinarily high cannot be laid at the door of failure of the state to invest in physical and human capital, at least in recent years. Since 1970, the stock of machinery, equipment, and nonresidential structures has more than tripled. Furthermore, during 1971-85, the number of agronomists, veterinarians, and other livestock specialists increased by 86 percent over the very low numbers of 1970.² Despite these enormous increases in physical and human capital, the USSR has made little progress in reducing labor inputs per unit of physical output. In some republics, labor inputs for farm products have actually increased in the past decade (table 2). Finally, despite a large labor force and generous investments, growth in net farm output in the USSR since 1970 has lagged badly behind that in the US and Eastern Europe, where fixed capital has increased at slower rates and employment in agriculture has declined more rapidly (table 3).

TABLE 2.—DIRECT LABOR OUTLAYS PER CENTNER OF OUTPUT FOR SELECTED FARM PRODUCTS

	[Man-hours]					
	Collective farms			State farms		
	1971-75	1976-80	1981-85	1971-75	1976-80	1981-85
USSR:						
Grain	1.8	1.4	1.3	1.3	1.1	1.3
Beef	61.0	53.0	51.0	46.0	41.0	41.0
Milk	11.0	10.0	9.0	9.0	8.0	8.0
RSFSR:						
Grain	1.6	1.3	1.2	1.2	1.1	1.1
Beef	58.0	55.0	51.0	44.0	39.0	38.0
Milk	11.0	10.0	9.0	9.0	8.0	7.0
Ukraine:						
Grain	1.7	1.3	1.2	1.1	1.1	1.1
Beef	73.4	60.3	57.3	46.4	42.4	41.4
Milk	11.9	10.3	9.9	8.1	7.5	7.1
Belorussia:						
Grain	2.5	2.0	NA	2.9	2.4	NA
Beef	49.0	45.0	45.0	41.0	38.0	39.0
Milk	11.0	9.0	9.0	10.0	9.0	8.0
Lithuania:						
Grain	2.4	1.8	¹ 1.4	2.3	2.0	¹ 1.6
Beef	35.0	30.0	¹ 30.0	29.0	28.0	¹ 28.0
Milk	7.0	5.0	¹ 5.0	7.0	6.0	¹ 5.0
Kazakhstan:						
Grain	1.4	1.1	1.3	1.1	.9	1.1
Beef	52.0	52.0	55.0	50.0	44.0	47.0
Milk	11.0	9.0	9.0	9.0	8.0	8.0
Uzbekistan:						
Grain	10.9	7.4	8.1	7.0	5.0	6.6
Beef	86.0	65.0	71.0	61.0	59.0	69.0
Milk	14.0	11.0	11.0	13.0	11.0	11.0

¹ Includes 1982-85.

² In 1985, these workers still accounted for only 4.4 percent of employment in agricultural work in the socialized sector.

Source: Data are from various issues of "Narodnoye khozyaystvo SSSR" and from handbooks of the union republics included in the table. Data for the Ukraine are from the 1985 Ukrainian handbook and differ somewhat from averages that can be calculated from "Narodnoye khozyaystvo SSSR."

TABLE 3.—LABOR AND CAPITAL INPUTS, AND NET OUTPUT OF AGRICULTURE, 1971-84—SELECTED COUNTRIES

[Average annual rates of growth]

	Labor ¹	Capital ²	Net Farm Output ³
USSR	0.1	9.0	0.9
Eastern Europe:			
Romania	-3.4	8.0	4.8
Hungary	-1.2	6.9	3.5
Bulgaria	-3.2	6.4	1.6
Czechoslovakia	-1.6	6.0	2.3
Poland	-3	5.0	1.0
East Germany	-7	4.9	2.8
United States	-3.2	2	2.0

¹ United States and Soviet labor data are derived from indexes of manhours worked in agriculture. Data for Eastern Europe are derived from indexes of full-time equivalent employees.

² Capital stock for the USSR and Eastern Europe includes machinery, equipment, and non-residential farm structures. Capital stock for the United States includes machinery only. All measures exclude housing and services.

³ Gross production less seed, feed, and waste.

Sources: USSR: Workhours in agriculture are from Rapawy (op. cit). His estimates are adjusted to include an estimate of workers drawn from other sectors of the economy to work temporarily in agriculture. Capital stock data are from "Soviet Statistics on Capital Formation," Central Intelligence Agency, SOV 82-10093, August 1982. Indexes were updated using methodology described in this publication. Net farm output data are from "USSR Measures of Economic Growth and Development, 1950-80," United States Congress, Joint Economic Committee, 1982, pp. 290-292. Indexes were updated according to the methodology described in this publication.

Eastern Europe: Data for labor and for net farm output are from Thad Alton, et al., "Agricultural Output, Expenses and Depreciation, Gross Product, and Net Product in Eastern Europe 1965, 1970, and 1975-85," Occasional Paper No. 91, Research Project on National Income in East Central Europe, L.W. International Financial Research Inc., 1986. Capital stock data were published by the same organization in a compendium of working papers published in September 1986.

United States: United States data are from "Agricultural Statistics 1985," U.S. Department of Agriculture, p. 391.

Nor can the low level and slow growth of labor productivity be attributed to the failure to raise farm wages. Since the death of Stalin, the USSR has deliberately pursued a policy of increasing farm wages in order to enhance incentives and also to reduce the large urban-rural income gaps. Although the gap has narrowed markedly, the productivity payoff has been unexpectedly small. Since 1970, wages for farm workers have risen twice as fast as labor productivity, contributing to the soaring costs of production in agriculture.

For decades, Soviet policymakers have expressed great concern about the poor utilization of labor resources in agriculture, and program after program has been enacted to remedy matters. Results have been disappointing. Given the present stringency in supplies of labor and investment and General Secretary Gorbachev's ambitious goals for the economy, a real breakthrough in the productivity of farm labor is badly needed to reduce the tremendous burden of agriculture on the Soviet economy and to release labor now tied up in agriculture to other sectors.

After providing a brief description of the present farm labor force and setting forth the main reasons for its low productivity, this paper describes the major remedial actions taken since 1975, in particular the Food Program adopted in May 1982 and carrying Gorbachev's continuing endorsement. A final section considers actions taken or planned since his advent to power in March 1985 and assesses their prospects for alleviation of the long-standing problems.

II. THE AGRICULTURAL LABOR FORCE

Agricultural workers fall into three basic categories—workers and employees on state farms, collective farmers, and persons engaged in private farming, keeping a few livestock and working garden plots for their own use and the local market. Employment on state farms and in other state agricultural enterprises has more than tripled since 1950 reaching about 12 million in 1985. Of this number, 11 million were employed directly in agriculture, while the remainder worked within the farm sector in farm-related activities such as repair, food processing, and so forth. The share of total manhours in agriculture attributable to state farm workers has risen sharply since 1975.

Until 1955, the bulk of agricultural employment was engaged in collective farming. However, due to the gradual conversion of collective farms to state farms, and the creation of new state farms in previously unfarmed regions, employment in the two sectors is now almost equal. In 1985, average annual employment on collective farms totaled about 12.8 million, of which about 10 million were employed directly in agriculture.

Both collective farmers and state employees are permitted to cultivate small private plots of agricultural land, up to 0.5 hectare in size, and to keep livestock. According to Western estimates, employment in private agriculture has remained relatively stable since 1950—between 12 and 10 million full time equivalent employees. Restrictions on private agriculture are now relatively relaxed, but a gradual decline in the role of private farming is continuing. Nevertheless, the private sector still contributes some 25 percent of total agricultural production.

The Soviet farm sector annually recruits students, military personnel, and non-farm industrial workers to provide temporary help, mostly during the harvest season. During peak periods in 1984, for example, the agricultural labor force swelled by 18 million people because of temporary labor sent to work on farms.³ Enterprises send roughly 10 percent of their work force for harvest support. Students and school children also work in the fields. Some schools close completely for several months during peak agricultural periods. Despite the high cost and low efficiency of temporary labor, the Soviets continue to make heavy use of it. Policymakers are now advocating, however, that this "harvest drain" on nonfarm sectors be ended.

III. WHY LABOR PRODUCTIVITY IS LOW

The reasons for the low productivity and large labor requirements in Soviet agriculture are many and complex. In fact, they are rooted in the very system of state-run agriculture and its traumatic founding. We focus here on several problems that relate

³ *Narodnoye khozyaystvo SSSR v 1984 godu* reports that in 1984 the average annual number of workers "attached" from enterprises to work on farms was 1.5 million (p. 326.) To derive the total number of people involved in temporary, seasonal activity, Soviet economists assume that each temporary worker works only one month per year. The average annual figure of 1.5 million, therefore, consists of 18 million people working one month each. Alec Nove cites figures derived in this manner in "Why the Russians Are So Short of Food," *London Times*, 18 November 1981, p. 32.

most directly to labor productivity per se and that have been the subject of regime policies and concern in recent years.

A. PAY IS NOT SUFFICIENTLY LINKED TO PERFORMANCE

Farm workers are paid on the basis of an extremely complex system of wages and bonuses. As in industry, jobs are classified into labor grades on the basis of their difficulty and the skills required.⁴ Each grade is assigned a rate differential over the minimum wage applicable to the lowest grade. Workers are assigned a fixed unit of work (norm), such as the number of hectares to be plowed in a day. If the norms are met, workers are entitled to the basic pay rate for their labor grades. Numerous complicated bonuses—for exceeding the norms, for cost savings, product quality, and so forth, provide a supplement to the basic wage. Farm managers and technical specialists receive salaries plus various bonuses related mainly to meeting plan targets.

This system of financial incentives contributes to low productivity.

- Pay depends mainly on the quantity of work done, not the quality. There is little incentive to do work well.
- The size of the harvest has little impact on incomes. A good harvest does not raise incomes proportionately, and in years of unfavorable weather, the threat of income loss is minimal. Thus, there is little incentive to work harder to overcome the effects of poor weather.
- There is little incentive to produce high quality output or to use inputs more efficiently, because bonuses for product quality and costs savings are, in practice, a very small share of wage payments, especially for managers and specialists.
- Farms have little opportunity to adjust wages in response to changes in supply and demand for various kinds of skilled workers.
- The nature of the system for organizing labor activity, in which each phase of the production cycle is carried out by different workers, has hampered efforts to relate individual incomes to the size and quality of the harvest.

B. MACHINERY HAS NOT BEEN AN EFFECTIVE SUBSTITUTE FOR LABOR

Hard manual labor still predominates in the socialized sector of Soviet agriculture and is, of course, routine in the private sector. Although stocks of machinery on farms have grown rapidly since 1970, an aggregate measure of mechanization, such as tractor horsepower per 100 hectares, shows that the USSR is far behind the US and is about at the same level as the less mechanized agricultural sectors of Eastern Europe (table 4).⁵ One Soviet writer es-

⁴ For example, in 1984 on state farms, 32.9 percent of general machine operators, tractor drivers, and combine operators met requirements for Class I—the top skill level. Class II included 28.4 percent of these workers, Class III includes 37.3 percent, and 1.4 percent was ungraded. (V.A. Dobrynin, *Problemy povysheniya effektivnosti sel'skogokhozyaystvennogo proizvodstva*, Agropromizdat, Moscow, 1986, p. 81.)

⁵ When these comparisons are restricted to climatically similar areas, the gap between the USSR and the US is smaller. According to data presented by Johnson and Brooks, horsepower per hectare in the USSR is probably about two-thirds of that in climatically similar areas of the US. (Johnson and Brooks, *op. cit.*, p. 141.)

timates that almost 350 productive operations in agriculture are done manually and absorb almost 16 million people.⁶

TABLE 4.—COMPARISONS OF TRACTOR HORSEPOWER IN THE US, USSR, AND EASTERN EUROPE

[Horsepower per 100 hectares]

	1970	1983
USSR.....	48	93
Eastern Europe:		
Bulgaria.....	48	95
Hungary.....	56	86
East Germany.....	134	206
Poland.....	50	219
Romania.....	59	106
Czechoslovakia.....	108	175
US.....	115	163

Source: Land data used in this calculation are from "FAO Production Yearbook, 1971" and "FAO Production Yearbook, 1984." Land is defined as arable land plus permanent crops. Tractor horsepower data for the USSR and Eastern Europe are from "Statisticheskii yezhegodnik stran-chlenov soveta ekonomicheskoy vzaimopomoshchi, 1985." Tractor horsepower data for the US are from "Agricultural Statistics, 1985."

Several factors account for the lack of effective mechanization. First, factories produce farm machinery of low reliability. According to officials of the Ministry of Tractor and Agricultural Machinebuilding, "During the operation of equipment, massive defects are observed in connection with welded joints, assembly work, adjustments, and painting."⁷ The difficulty and expense involved in obtaining repair services results in large amounts of downtime. Second, the assortment of farm machinery is deficient in many respects and poorly tailored to the particular needs of individual farms. While all deficiencies reduce the productivity of resources in agriculture, several are directly responsible for keeping labor requirements in agriculture high.

—Many agricultural operations are only partially mechanized, necessitating the use of supplementary manual labor. A lack of attachments for tractors and other machinery hampers farm efforts to complete the mechanization process (table 5).⁸

TABLE 5.—USSR: MECHANIZED AND MANUAL LABOR ON STATE AND COLLECTIVE FARMS

[Percent of farm workers]

	Workers engaged in: ¹		
	Mechanized tasks and supervision of machinery ²	Manual labor (with and without tools and machines) ³	Repair and adjustment of machinery
Collective farms:			
Crop raising:			
1982.....	23.6	75.2	1.2
1985.....	25.5	73.3	1.2
Animal husbandry:			
1982.....	23.5	73.9	2.6
1985.....	28.3	68.5	3.2

⁶ V.A. Dobrynin *op. cit.* p. 70.

⁷ Proceedings of a meeting of the Collegium of the Ministry of Tractor and Agricultural Machinebuilding, reported by V. Gavrichkin in *Izvestiya*, 6 December 1986, p. 2.

⁸ Johnson and Brooks, *op. cit.*, p. 166.

TABLE 5.—USSR: MECHANIZED AND MANUAL LABOR ON STATE AND COLLECTIVE FARMS—Continued

[Percent of farm workers]

	Workers engaged in: ¹		
	Mechanized tasks and supervision of machinery ²	Manual labor (with and without tools and machines) ³	Repair and adjustment of machinery
State farms:			
Crop raising:			
1975.....	24.9	75.1	
1982.....	27.0	71.2	1.8
1985.....	28.5	69.8	1.7
Animal husbandry:			
1975.....	17.7	78.8	3.5
1982.....	19.4	76.9	3.7
1985.....	23.6	72.4	4.0

¹ The definitions of these categories are not given.² Soviet agricultural employment statistics suggest that this category may consist primarily of tractor, combine, and truck drivers, and general machinery operators. It probably also includes workers that supervise mechanized livestock operations such as feed distribution and milking.³ This category almost certainly includes workers using hand implements such as hoes and rakes. It probably also includes workers using machines that require a large component of manual labor, such as feed mixers that are filled and emptied by hand.

Source: "Narodnoye khozyaystvo SSSR 1985," p. 56

- According to the Minister of Machinebuilding for Animal Husbandry and Feed Production, in the 11th Five Year Plan, the majority of new models were merely replacements for obsolete models of existing machines.⁹ Too few new machinery models were aimed at mechanizing operations presently done by hand.
- The park of agricultural machinery is not structured to facilitate "ganging," that is, linking several machines together in order to perform several operations, such as plowing, fertilizing, and seeding, in one trip through the fields.
- Shortages and maldistribution of spare parts are legendary, forcing farm workers to resort to hand operations because machines are inoperative.

C. RETAINING SKILLED WORKERS IS DIFFICULT

General Secretary Brezhnev stated in 1982 that less than half of all trained agricultural specialists are employed on state and collective farms.¹⁰ About 35 to 40 percent of the higher and specialized secondary school graduates who are directed to farms either do not report for their assignments or leave shortly thereafter—largely because of dissatisfaction with working and living conditions in rural areas. For example, relatively few workers trained to operate tractors, trucks, and grain combines actually end up doing so. During 1981–85, over 7 million farm machinery operators were trained in vocational-technical schools or on farms, but the total number of operators working in agriculture increased by only 147,000 during this period. Soviet sources suggest that the shortage of machine operators is quite severe in some areas. In 1985, for the country as a whole, there were 10 machinery operators for every 10 tractors, instead of the 12–13 considered necessary for full use of the machinery park. In the Non-Black Soil Zone of the RSFSR,

⁹ L. Khitrin, *Ekonomika sel'skogo khozyaystva*, no. 10, 1986.¹⁰ *Pravda*, 24 March 1982, p. 1.

however, there were only 8.8 operators per 10 tractors. For some oblasts within the Non-Black Soil Zone, the number of operators per 10 tractors was as low as 6.7-7.4.¹¹

Engineers and technicians to maintain farm machinery are in very short supply, averaging only 6 per farm in 1985. Each was responsible for 14 tractors and grain combines and a large quantity of other machinery and equipment. This shortage has greatly complicated the repair and servicing of machinery.¹²

Many agricultural specialists claim to be dissatisfied because they are not working at jobs for which they are trained. Women, in particular, are dissatisfied with employment opportunities. Women comprise a substantial portion of technical agricultural professionals: 30 percent of agronomists, more than 50 percent of livestock specialists, and 40 percent of veterinary personnel. Nevertheless, women are employed mainly in unappealing manual jobs that have had low priority in terms of mechanization. According to Soviet sociologist, Tatyana Zaslavskaya, "a secondary school graduate who wants to remain in the village has almost no choice but to become a milkmaid."¹³

As with skilled workers and professionals, turnover is high among farm managers and supervisory personnel. A 1983 Soviet article notes, for example, that during the preceding five years, about 85 percent of all farm managers in Georgia and Azerbaidzhan changed jobs.¹⁴ The inexperience of many managers and poor quality of others have been cited as hindrances to agriculture's performance.

D. RURAL LIVING STANDARDS ARE LOW

While the gap has been narrowing, quantitative measures indicate that rural living standards are probably between two-thirds and three-quarters of those in urban areas; anecdotal evidence suggests, however, that qualitative differences are much larger.¹⁵ In both regards, the differences vary greatly among regions of the country. Particularly trying to rural residents is the paucity of housing amenities, greatly inadequate recreation facilities, and lack of personal services of all kinds. Soviet surveys indicate that improving living conditions on farms ranks equally with wages as a means of attracting and retaining skilled workers. Inadequate housing and services were cited as the principal reasons for the high rate of migration of farm workers in the Ukraine during 1976-80.¹⁶ Low rural living standards also make it difficult to attract and retain qualified teachers and medical personnel. As a result, health care generally for rural residents is far less than

¹¹ Dobrynin *op.cit.*, pp. 74, 81. The size of Soviet farms is enormous. In 1985, the average collective farm had 6400 hectares of agricultural land, 1930 head of cattle, 44 tractors, and 485 workers. The average state farm had 16,100 hectares, 1881 cattle, 57 tractors, and 529 workers. (*Narodnoye khozyaystvo SSSR v 1985 godu*), pp. 278, 286-87.

¹² Dobrynin, *op.cit.* p. 83.

¹³ *Sovetskaya kultura*, 23 January 1986, p. 3.

¹⁴ *Bakinskiy rabochiy*, 29 April 1983, pp. 1-3; *Sovetskaya Rossiya*, 9 May 1984, p. 2; V. Gayevskaya, *Vestnik statistiki*, no. 6, 1983, pp. 14-18.

¹⁵ Gertrude E. Schroeder, "Rural Living Standards in the Soviet Union", in Robert C. Stuart, ed. *The Soviet Rural Economy*, Totowa, NJ, Roman and Allanheld, 1983, pp. 241-257.

¹⁶ A.N. Alymov and F.D. Zastavniy, *Regional'nye problemy ekonomicheskogo i sotsial'nogo razvitiya*, Moscow, 1982.

that for urban residents, and contributes to dissatisfaction with rural living. A lack of transportation, furthermore, makes access to consumer services difficult and creates a sense of isolation.

E. RURAL EDUCATION PROGRAMS ARE OF LOW QUALITY

Rural general education schools are usually small and poorly staffed. Some schools do not offer even basic courses because of the shortage of trained staff. Vocational-technical schools, which supply about half of agriculture's demand for new workers each year, operate in only 70 percent of rural rayons in the USSR. Furthermore, they have been criticized for neglecting specialties in short supply, such as animal husbandry, construction, and repair and technical servicing of machinery.

In addition to the shortage of schools, the low prestige of rural agricultural occupations and widespread criticism of the training make it difficult for rural vocational-technical schools to attract students. In the Baltic republics, about 30 percent of rural eighth-grade graduates enroll in rural vocational schools, while in Central Asia the share is only 10 percent.¹⁷ Farm managers are reluctant to release young workers for training because of the three-year absence from work and the risk that they will not return after graduation. Education officials accuse farm managers of indifference, claiming they fail to stimulate interest in agricultural occupations either through career counseling or by giving newly-trained workers appropriate assignments and equipment.

Although significant advances have been made in narrowing the gaps in educational attainment between the urban and rural population, according to 1979 census data, 70 percent of collective farmers had not completed secondary education.¹⁸ Moreover, more than one-third of those classified as engineers and technicians had no formal technical training.¹⁹

Low educational standards have a direct impact on productivity. Soviet writers claim that the professional level of machinery operators has not been high enough to enable them to use complicated farm machinery. Furthermore, successful use of the collective contract system of labor organization has been prevented, in part, because workers are not well enough trained to assume responsibility for the entire crop production cycle. Finally, lack of good educational opportunities for their children is often cited by young families as a major reason for leaving farms.

F. THE RURAL POPULATION IS AGING

The 1979 census results indicate that 18 percent of the total rural population is of retirement age, (females over 55 and males over 60 years of age) an increase of 3 percentage points over 1970 levels. The share of elderly people in the rural population varies widely among regions. In 1970, for example, there were 8 regions of the RSFSR where at least 30 percent of the rural population exceeded pension age. By 1978, the number of such regions had in-

¹⁷ Article by Evi Saar, translated in *Political and Sociological Affairs*, no. 1229, Joint Publications Research Service, 22 March 1982, p. 12.

¹⁸ *Chislennost' i sostav naseleniya SSSR*, Central Statistical Administration, Moscow, 1984.

¹⁹ *Pravda*, 24 March 1982, p. 1.

creased to 22, including 16 in the Non-Black Soil Zone. Females, moreover, account for a large share of the rural elderly, outnumbering pension-age males by 3 to 1.²⁰ In regions with relatively high birth rates, however, the share of pension-age rural residents is small. For example, in 1979, the share of pension-age rural residents in Uzbekistan was only 8 percent.²¹

Older workers are employed mainly on private plots and during peak agricultural periods and in manual jobs unappealing to younger, better educated workers. Most employed pensioners continue working for only a short time—1 to 4 years—after achieving pension eligibility, particularly on farms which have a low level of mechanization or make no provision for part-time or less strenuous work.

An important cause of the skewed age structure in many rural areas is the large out-migration of young people. Unfortunately, most of the rural-urban migration has occurred in regions with low birth rates, such as the RSFSR, thus creating shortages of labor on farms in those areas. Some farming regions of the Non-Black Soil Zone have seen their populations reduced by half in the past 25 years. Average annual employment on farms in the Non-Black Soil Zone decreased by 8 percent between 1975 and 1980, while employment in some oblasts of the Non-Black Soil Zone declined by as much as 18 percent. On the other hand, areas with high birth rates, such as Central Asia, showed relatively slower migration trends leading to labor surpluses. Average annual employment in agricultural during 1976–80 increased by 10 percent in the Central Asian republics and Kazakhstan and by 8 percent in the Transcaucasian republics.

IV. EFFORTS TO COPE IN THE 10TH AND 11TH FIVE YEAR PLAN PERIODS

A. MEASURES TAKEN

Between 1976 and Gorbachev's advent to power in early 1985, a large number of decrees were issued and other measures taken in a many-sided effort to improve the productivity and distribution of the agricultural labor force. Major decrees were issued in 1978, 1980, and 1982, the latter—the Food Program—being by far the most important. In summary, the measures taken amounted to:

- Making minor adjustments to the existing system of wages and bonuses.
- Allocating more investment funds for rural housing, roads, and other infrastructure as well as for the agricultural machinery industry.

²⁰ For the USSR as a whole, the sex structure of the younger rural population is in balance. Although women predominated in the past, the share of men has risen. This increase has occurred because the number of jobs for machinery operators has risen and because younger women have increasingly migrated to cities owing to a lack of jobs in the rural trade and services sectors. See Ksenya Khinchuk, "Agricultural Labor Force in the Soviet Union," *Soviet Geography*, Vol. XXVIII, February 1987, pp. 90–115.

²¹ Murray Feshbach, "The Age Structure of the Soviet Population: Preliminary Analysis of Unpublished Data," *Soviet Economy*, no. 2, 1985, pp. 177–193.

- Offering non-monetary incentives to attract skilled workers to agriculture and encouraging workers in areas of surplus labor to resettle in areas of labor shortages.
- Attempting to get the collective contract system of labor organization off the ground.

1. *The major decrees*

The July 1978 plenum and its 12 associated decrees were concerned almost exclusively with improving on-farm technology in areas such as feed production and livestock raising. The only steps taken to improve the labor situation involved credits and incentives for building individual housing and reduction of downpayment requirements for professionals, pensioners, and on farms where labor was in short supply. The July 1978 plenum noted the need for a better incentive system and charged the Council of Ministers with drawing up proposals.

In November 1980, a decree was published in response to the 1978 call for a better incentive system.²² The decree made numerous small changes to the basic piecework plus bonus wage system without changing its essential features. Bonuses were to be given to managers and professionals for increasing farm production, or profits, or for reducing losses. These bonuses would not be paid in full, however, unless the annual plan for grain and meat production, forage production, and for sales to state procurement organizations were also fulfilled. To reduce turnover, the decree allowed farms to raise wages for skilled repair workers and engineering-technical personnel with high qualifications. These increases, however, had to come from wage fund savings and could not increase total wage paid. Farms were authorized to borrow money from the state bank to pay wages, salaries, and bonuses for above-plan output.

The May 1982 Food Program put far more emphasis on labor issues than did earlier decrees. Four of the six decrees associated with the Food Program addressed the problems of retaining, training, and improving living conditions and incentives for farm workers.²³ The Food Program, in conjunction with the 11th Five Year Plan, also called for a greater share of investment to be allocated to developing rural infrastructure—housing, schools, roads, and other services.

A second major focus of the Food Program was the establishment of a number of special incentives for people transferring to work on farms as managers and professionals. Young professionals were offered free apartments for three years, a special allowance for setting up households, and priority in purchasing cars and motorcycles.

²² The decree was titled "On Improving the Planning of, and the Provision of Economic Incentives for, the Production and Procurement of Agricultural Products." (*Ekonomicheskaya gazeta*, no. 52, December 1980, pp. 5-7.)

²³ These decrees were (1) "On Measures to Enhance Material Incentives of Workers to Increase Output and Improve its Quality;" (2) "On Additional Measures to Induce Livestock Workers to Stay on Their Jobs at Collective and State Farms and Other Agricultural Enterprises;" (3) "On Measures to Improve Further Housing, Communal and Other Services;" (4) "On Further Reinforcing Collective and State Farms With Leading Cadres and Specialists, Enhancing Their Role and Responsibility in Developing Agricultural Production."

There was also an effort in the Food Program to tackle regional problems of labor distribution. It called for expansion of education of engineers, veterinarians, and bookkeepers especially in the Non-Black Soil Zone, the Central Chernozem region, Siberia, Northern Kazakhstan, and the Far East. Furthermore, special wage increments and vacation time were provided for livestock workers. This provision was to be put into effect first in the Non-Black Soil Zone, Siberia, the Far East, the Ural region, and the Central Chernozem region.

The Food Program, as did the 11th Five Year Plan, continued the policy of raising farm wages faster than those of other workers. Managers, semiprofessionals, and professionals received additional pay raises and bonuses. Furthermore, agricultural workers were to receive a larger share of wages in products, primarily grain, fruit, and vegetables. Policymakers recognized that payments in the form of scarce or expensive farm products often provide greater incentive than money payments that cannot be spent on goods and services that the population wants.

Mechanization of farm operations was also treated in the 11th Five Year Plan and in the Food Program, which called for 60-70 billion rubles worth of machinery to be delivered to farms in the 1980s—almost double the value of shipments in the 1970s. Although top priority for the 1981-85 period was to be the modernization of the park of grain combines, the Food Program provided a comprehensive list of machinery that was to be developed "at an accelerated rate." By including smallscale equipment for farms and the population on this list, the Food Program repeated the perennial promise to enhance mechanization in private agriculture. In addition, the Food Program called for improved quality and reliability of farm machinery and an expansion of machinery repair and storage facilities. To support these goals, investment in the agricultural machinery industry in the 1980s was to be double that of the 1970s.²⁴ By 1985, grain production, and harvesting of sugarbeets and flax was to be fully mechanized. The proportion of potatoes and vegetables harvested by machine was to increase substantially as was integrated mechanization at livestock complexes.²⁵

An additional measure was taken to ensure that the farm machinery industry adequately supported the goals of the Food Program. A special decree, issued in April 1983, obliged the various branches of industry to provide producers of farm machinery with high-quality materials and component parts.²⁶ Producers of fuel and raw materials were instructed to supply farm machinery plants as ordered, regardless of the level of their own plan fulfillment. To help speed up the expansion of the farm machinery industry, limits on investment in these industries were raised for the remainder of the 11th Five Year Plan period.

Perhaps the most celebrated of the Food Program's many provisions was its strong advocacy of the collective contract approach to organizing farm workers. Although collective contracting has exist-

²⁴ A.I. Stepanov, *Realizatsiya agrarnoy politiki KPSS*, Moscow, 1985, p. 33.

²⁵ *Ekonomika sel'skogo khozyaystva*, no. 12, 1981, p. 9.

²⁶ The decree "On Measures to Further Enhance the Technical Standard and Quality of Machinery and Equipment for Agriculture, Improve Their Utilization and Increase Production and Deliveries of Them in 1983-90," was published in *Pravda*, 10 April 1983, p. 1.

ed largely on an experimental basis since the 1960s, it now received new emphasis and leadership support. An all-union conference on introduction of the collective contract was convened in 1983 where the contract was strongly endorsed by Gorbachev. In his speech, he stated that "One specific and effective form which can be employed for . . . achieving considerable growth in the production of goods and a savings in resources is that of a collective contract . . . In such collectives the labor productivity is considerably higher, production costs are lower and, it follows, the return from investments is considerably better."²⁷

In this system, semi-autonomous brigades or teams, usually made up of machine operators, work under a contract with the farm to deliver specified farm products at a stipulated price per unit. The teams are given latitude to manage the production process as they see fit. The farm, for its part, guarantees the required machinery, fertilizer, and other supplies. The quantities of these inputs that the team should need to fulfill the contract are determined in advance according to norms.

During the growing season, workers receive monthly cash advances. Total earnings for the team are determined after the harvest depending on quantities actually produced and the contract price per unit. Total earnings are increased if the team has used less than the normed quantities of inputs. Earnings are reduced by the amount of any overexpenditure. The excess of total earnings over the sum of advance payments is given to the team to be divided among members according to the contribution of each worker as determined by the team.

According to the Soviet statistical handbooks, the number of contracting teams increased from 57 thousand in 1982 to 337 thousand in 1985. There were 1.1 million workers in contract teams in 1982 and 7.1 million in 1985.²⁸ Soviet writers claim that, by 1985, teams operated on 65 percent of arable land on state and collective farms and grew two-thirds of grain and forage crops, three-fourths of potatoes and vegetables, almost all sugarbeets, and two-thirds of fiber flax. Official statistics show that coverage in the livestock sector was somewhat less—34 percent of cattle, 42 percent of hogs, 73 percent of sheep and 56 percent of poultry.²⁹

Soviet authors claim that properly organized teams obtain higher yields at lower cost and use less labor. According to the Central Statistical Administration, in 1984, grain yields of contract teams were 16 percent higher and labor outlays per centner of grain and other crops were 8–10 percent lower than those obtained without using contract teams. Production per head of livestock was also higher—22 percent for fattening of cattle, 14 percent for hog raising, and 12 percent for sheep raising.³⁰

Despite the glowing claims for the benefits of collective contracts and their rapid spread, the overall productivity record suggests

²⁷ Expanded version of Gorbachev's speech to the 1983 all-union conference on the introduction of the collective contract in agriculture. (N. Ye. Kruchina and S.G. Andreyev, *Kollektivnyy podryad na sele*, Moscow, 1983, pp. 7–24.)

²⁸ *Narodnoye khozyaystvo SSSR v 1984 godu*, p. 327 and *Narodnoye khozyaystvo SSSR v 1985 godu*, p. 306. These data imply that during 1982–85, teams averaged 15–21 members.

²⁹ *Ekonomika sel'skogo khozyaystva*, no. 7, 1986, p. 3.

³⁰ *Planirovaniye i uchet v selskokhozyaystvennykh predpriyatiyakh*, no. 6, 1986, pp. 2–6.

that, at the aggregate level, by the end of the 11th Five Year Plan, their impact was minimal. Soviet writers admit that many contract teams exist in name only and that there have been numerous barriers to full implementation.

First, Soviet authors point out a number of problems associated with forming teams. Potential productivity gains are eroded and wage costs are kept high because teams often include more workers than norms call for.³¹ Some teams, furthermore, are allowed to "migrate," that is, work in several areas of the farm, spending only 20-30 percent of the time in their own fields. In these cases, contract earnings are only a small share of their total receipts, giving the workers little interest in the final harvest results.³² The effectiveness of teams is also undermined by a high rate of turnover among machine operators.

Second, in some cases teams have been unsuccessful because farms do not supply the necessary inputs. Either the farm does not receive the inputs in the first place, or switches them to other uses. Furthermore, farm managers, under pressure to meet plan targets, limit the decisionmaking authority of the team. The salaried farm managers and professionals, who receive no reward for introducing collective contracts, have no great incentive to turn control over to team leaders and thus jeopardize plan targets. In some areas of the RSFSR and the Ukraine, farms have withheld payments due to teams in order not to overspend the wage fund.³³

Finally, there have been financial problems. In theory the team is supposed to divide both the advance payment and the post-harvest settlement among its members. In practice, however, many farms have been using individual piecework payments, which are comparatively easy to administer, to allocate the advance payments.³⁴ Dividing the post-harvest settlement also has proved cumbersome and contentious because each worker's share is supposed to be determined according to "labor participation coefficients," which involve complex calculations taking into account everything from skill levels and job difficulty to the worker's attitude toward the job. Teams have also faced difficulty and even disbanded because inappropriate or inaccurate norms have been used to calculate the quantities of fertilizer and other inputs that the team should need to fulfill the contract.³⁵

2. Other measures

Two additional aspects of Soviet policy toward agricultural labor are (a) the redistribution and resettlement schemes that have been promoted over the years, and (b) attempts to improve educational opportunities for rural youth.

Because the system of labor and wages in agriculture does not allocate available labor resources efficiently, policymakers have supported resettlement schemes to help correct regional imbalances in labor supply. In the southern republics, where there is a

³¹ *Ibid.*

³² V. Zhurikov, *Planovoye khozyaystvo*, no. 8, 1985, pp. 86-91.

³³ *Ibid.*

³⁴ *Ekonomika sel'skogo khozyaystva*, no. 7, 1986, pp. 3-10.

³⁵ V.P. Gagnon provides a good discussion of these points in "Gorbachev and the Collective Contract," *Soviet Studies*, vol. XXXIX, no. 1, January 1987, pp. 1-23.

surplus of labor on many farms, rural outmigration has been encouraged. Programs are being designed to increase educational attainment and vocational training in order to expand employment opportunities outside of agriculture. Despite efforts to resettle rural Central Asian families to farms in labor-short areas such as the Non-Black Soil Zone and the Far East, strong ethnic and cultural traditions, large family size, and language barriers provide formidable barriers to success.

Past attempts to encourage resettlement have been costly and ineffective. For example, the Komsomol promoted a resettlement program involving mass mobilization of Central Asian young people. However, during 1981-84, only one-third of the Uzbeks recruited to the Non-Black Soil Zone had settled there. Among the reasons for leaving, the returnees cite poor organization of food and consumer services, a large share of manual labor and shortages of equipment, machinery, and construction materials.³⁶ The cost of programs of this type, moreover, is probably extremely high. It is clear from the fragmentary evidence available that no significant redistribution of population from South to North is occurring.

Another longstanding resettlement program, designed to eliminate sparsely populated settlements and centralize support services and social infrastructure, called for closing down 348,000 small villages—the so-called “futureless” hamlets. The plan has not worked, however, largely because of opposition from villagers who were reluctant to move or, when they did so, moved to larger cities instead of to regional centers as was intended. Indeed, the program, because of its unpopularity and considerable expense, appears to have been abandoned.

Several special measures are designed to upgrade the quality of the farm labor force through better education. Graduates of general secondary schools with training in animal husbandry who enroll in rural vocational-technical schools will receive monthly stipends of 96 to 104 rubles. Also, state farm and other agricultural enterprises will pay rural vocational school graduates who accept employment in agriculture lump sum grants of 500 rubles, equivalent to about 30 percent of their first year's pay. Rural youth will be given preference for admission to these schools. The quota for females will be set at one-third of total enrollment, and training in nonagricultural occupations is to be expanded to keep young females from migrating to urban areas.³⁷

In 1981, the admissions policy in higher schools was changed to provide for noncompetitive admission to the correspondence (home study) division for rural students sponsored by farms. Educators readily admit the qualitative drawbacks of part-time education, but they believe that workers sponsored by their farms for training in the home-study programs will be more likely to continue working on those farms once they have completed their education.

³⁶ I. Orlova, *Kadry sel'skogo khozyaystva*, no. 2, 1982.

³⁷ A. Osipov, *Ekonomika sel'skogo khozyaystva*, no. 8, 1984, pp. 3-10.

B. AN ASSESSMENT OF PROGRESS IN 1983-86

Despite their enshrinement in the 1982 Food Program, Soviet policies toward agricultural labor as yet have done little to improve incentives, increase the proportion of skilled workers in farm employment, or alter the regional distribution of farm labor. On the positive side, however, there was some decline in 1983-85 in the growth rate of farm employment in some of the southern, labor-surplus republics compared with 1976-80 and 1981-82. (table 6). In the RSFSR and the Ukraine, farm employment declined at more rapid rates than those of earlier periods. These trends probably continued in 1986; the plan fulfillment for the USSR as a whole implied a drop of 1.8 percent in labor inputs in average annual employment in socialized agriculture.³⁸

TABLE 6.—USSR: GROWTH IN AGRICULTURAL EMPLOYMENT, SELECTED PERIODS

	[Average annual rates of growth]								
	1976-80			1981-82			1983-85		
	Total	State sector	Private sector	Total	State sector	Private sector	Total	State sector	Private sector
USSR.....	-0.7	-0.8	-0.5	-0.5	-0.2	2.1	-1.0	-0.8	-1.3
Baltics.....	-0.6	-0.8	-.4	1.1	-.1	2.4	-.3	0	-.5
Slavic.....	-1.3	-1.4	-1.1	-.4	-1.2	1.3	-1.5	-1.3	-1.8
RSFSR.....	-.9	-1.1	-.6	-.2	-1.0	1.5	-1.2	-1.0	-1.6
Ukraine.....	-1.9	-1.9	-1.7	-.8	-1.6	1.0	-2.1	-2.0	-2.2
Transcaucasus.....	1.2	1.0	1.4	2.2	1.2	3.8	-.1	.4	-.3
Kazakhstan.....	.9	.7	1.5	1.5	.8	3.2	.8	1.2	.1
Central Asia.....	1.9	1.9	2.1	4.9	2.3	6.7	.5	.6	.2

Estimates of average annual employment in agriculture are derived as follows:

1. Published data on total average annual employment on collective farms and in state agricultural enterprises include both work in agriculture per se and in industrial, construction, and service activities. Published data on the share of agricultural work alone in the total for the USSR as a whole were used to obtain similar numbers for the republics, on the assumption that the proportions did not differ among republics.

2. Private sector employment has been estimated by Stephen Rapawy ("Civilian Employment in the USSR, 1950 to 1983," CIR Staff Paper No. 10, August 1985). His methodology was used to obtain estimates for republics in 1975. The ratio of private sector employment to total farm employment that prevailed in 1975 were then used to estimate private sector employment in other years.

Soviet statistics suggest that at least some progress was made in boosting investment in housing, roads, and infrastructure. Investment for these purposes in 1981-85 was 50 percent above 1976-80 levels. Commissioning of rural housing in 1981-85 were 167 million square meters compared with 149 million in 1976-80.³⁹ During 1981-85, housing commissioned by collective farms—nearly one-fifth of total commissionings—was 50 percent above that in 1976-80. Progress in improving the quality of rural housing, however, has evidently been slow. As recently as 1985, new housing built by farms was remarkably primitive. A survey of such housing showed that only 30 percent had water, sewer, and central heat. A very large proportion of this housing (42 percent) was built with no amenities whatsoever.⁴⁰

Other Soviet statistics that shed light on rural living conditions show mixed results for the 1981-85 period. For example, after the

³⁸ Farm production increased by 5.1 percent in 1986 and labor productivity increased by 6.9 percent. These figures imply a reduction in labor inputs of 1.8 percent.

³⁹ The 1981-85 plan called for 176 million square meters of rural housing to be commissioned.

⁴⁰ Shares of housing with no amenities varied widely by region, ranging from a high of 63 percent in Kazakhstan to a low of 2 percent in the Baltics. The Slavic, Transcaucasian, and Central Asian regions all averaged around 40 percent. *Vestnik statistiki*, no. 5, 1987, p. 68.

Food Program, there was a sharp jump in the number of rural pre-school spaces commissioned, but commissionings of rural movie theatres, clubs, and cultural facilities showed no improvement. Although the Food Program promised 130,000 kilometers of general rural roads and 150,000 kilometers of internal farm roads, few data are available to assess progress in this important area.⁴¹

Retention of skilled workers is still a serious problem. The number of machinery operators actually declined slightly for the country as a whole during 1983-85. All of the decline occurred in the Slavic republics. In other regions, the number of these workers increased. While the number of machine operators was declining, furthermore, the number of tractors and grain combines on farms was increasing at an average annual rate of 2 percent per year.

An additional indicator of labor force quality, the number of professionals with higher and specialized secondary education, has shown only small gains since the Food Program was initiated. The number of agronomists per farm, for example, declined between 1983 and 1985. The largest gains in professionals per farm were made in the engineering-technical category (table 7).

TABLE 7.—USSR: PROFESSIONALS WITH HIGHER AND SPECIALIZED SECONDARY EDUCATION PER FARM

[As of 1 April]

	Agronomists		Veterinarians ¹		Engineers, technicians	
	1983	1985	1983	1985	1983	1985
USSR.....	1.9	1.8	2.1	2.2	3.3	3.6
Baltics.....	2.5	2.6	2.4	2.7	4.5	4.1
Slavic Republics.....	1.8	1.8	2.1	2.2	3.3	3.6
RSFSR.....	1.7	1.7	2.0	2.1	3.2	3.5
Ukraine.....	2.1	2.0	2.2	2.2	3.6	3.7
Transcaucasus.....	1.7	1.8	1.1	1.1	1.6	1.8
Kazakhstan.....	2.5	2.7	3.9	4.2	4.2	4.6
Central Asia.....	2.7	2.8	2.0	2.1	4.1	4.7

¹ Includes veterinarians and other veterinary workers.

Source: Derived from various issues of "Narodnoye khozyaystvo SSSR" using tables that show (1) the number of professionals, (2) the share of professionals with higher and specialized secondary education, and (3) the number of state and collective farms.

Despite efforts to improve agricultural machinery, Gorbachev noted in November 1986 that the development of new machinery was still lagging and that quality was still very low.⁴² Complaints by farmers about the newest grain combines, which were developed and produced on a high-priority, well-publicized basis, suggest that the Food Program and subsequent initiatives have had little effect on the quality of farm machinery.⁴³ There were also shortfalls in goals to mechanize farm operations. According to Soviet statistics, in 1985, harvesting of flax and sugarbeets was still not fully mechanized and less than half of potatoes were harvested by combine instead of the 65 percent targeted for 1985.⁴⁴

⁴¹ For more discussion of the problem of poor rural roads, see the paper by Judy Flynn and Barbara Serverin in this volume.

⁴² FBIS Daily Report: Soviet Union, 10 November 1986.

⁴³ *Izvestiya*, 29 July 1986.

⁴⁴ *Narodnoye khozyaystvo SSSR v 1985 godu*, p. 85.

Recent speeches by Soviet leaders suggest that their biggest disappointment is in the failure of collective contracts to stimulate productivity growth and reduce costs to the extent expected. Speaking to a January 1987 Central Committee conference, party secretary Nikonov stated that "When looking at the figures (those nominally working under collective contracts), it would appear that the march of labor contracting . . . is victorious; however, the high and highest productivity of labor of the proposed scale is not there."⁴⁵ Although official Soviet indexes show substantial improvement in labor productivity growth rates for the country as a whole during 1983-85, most of the gain occurred in 1983—a year when there were still comparatively few teams operating on collective contracts. In the RSFSR, however, improvement over 1981-82 was negligible. Furthermore, average annual growth in wages far outstripped growth in productivity in the country as a whole and in most republics (table 8). In 1986, however, the relationship was reversed for the USSR, as is typical in years of good harvests.

TABLE 8.—USSR: GROWTH IN AVERAGE WAGES AND PRODUCTIVITY IN SOCIALIZED AGRICULTURE

[Average annual rates of growth]

	1971-75		1976-80		1981-82		1983-85	
	Wages	Productivity	Wages	Productivity	Wages	Productivity	Wages	Productivity
USSR	4.8	1.4	4.6	2.9	3.8	2.0	5.5	3.2
Baltics:								
Lithuania	5.8	5.6	3.4	1.4	5.1	6.7	7.3	6.9
Latvia	5.2	3.2	4.7	3.2	5.2	3.9	8.3	5.1
Slavic Republics:								
RSFSR	5.6	1.4	3.8	2.1	4.9	3.7	6.0	3.8
Ukraine	4.1	2.3	4.9	3.5	4.1	4.7	5.6	6.3
Transcaucasus:								
Armenia	1.9	2.6	4.0	3.2	4.4	4.9	2.5	3.2
Georgia	4.2	3.2	8.9	5.0	2.8	.3	6.3	NA
Kazakhstan	3.7	-4.4	3.2	7.0	.9	-9.4	5.3	3.0
Central Asia:								
Kirgiziya	NA	NA	3.3	.4	2.2	-6.6	5.9	1.8
Uzbekistan	2.2	-4	6.0	2.8	-1.2	-5.3	1.2	-6

NA: Not available.

Source: Data on average monthly wages on state and collective farms are weighted together using numbers of employees to derive a single estimate of average monthly wages in socialized agriculture. Productivity growth is calculated from official Soviet indexes. Data are from "Narodnoye khozyaystvo SSSR" and from the statistical handbooks of the union republics. Republics included in the table are those for which 1985 data are presently available.

V. INITIATIVES FOR THE 12TH FIVE YEAR PLAN PERIOD

According to plan documents, "the entire increase in the output of agriculture . . . is to be achieved by raising labor productivity."⁴⁶ Labor productivity is scheduled to rise by 21.4 percent, while growth in farm production is to be 14.4 percent. These data imply an average annual reduction in labor inputs of 2.1 percent—three times the reduction achieved during 1971-85.

A key facet of the government's strategy to boost labor productivity is the program to raise rural living standards and improve

⁴⁵ FBIS Daily Report: Soviet Union, 30 January 1987, p. R27.

⁴⁶ FBIS Daily Report: Soviet Union, 12 March 1986.

the quality of rural life. In his speech to the 27th Party Congress, Gorbachev put the matter thus "But it is clear that the main motive force of progress, its soul, has been and will remain man. Today, as never before, agriculture needs people with an interest in working actively, with high professional skill and innovative bent. The strongest guarantee of our successes is constant concern for the agricultural worker's everyday working conditions. Our plans are aimed at this, and it is important that they be fulfilled rigorously."⁴⁷

In line with that sentiment, the various documents giving plans for raising living standards—notably the omnibus Consumer Goods and Services Program announced in late 1985 and the directives for the 12th Five Year Plan—explicitly attach priority to the countryside in a number of areas. Retail trade in rural areas is slated to increase by 25 percent during 1986–90, compared with 18–22 percent overall. Similarly, provision of paid services of all kinds is to develop at "priority" rates in rural areas. In a kind of do-it-yourself approach, consumer cooperatives (operating mainly in rural areas), state farms and collective farms are being tasked with expanding the production of simpler kinds of consumer goods, using off-season farm labor, and providing a sharply stepped-up flow of services to rural workers.⁴⁸ The latter are supposed to rise by 70 percent by 1990.

Perhaps the most touted goal is that for rural housing. The number of square meters built is slated to increase by 27 percent, double the growth achieved in 1981–85. The goal is to be accomplished with only a 30 percent increase in investment, implying the intent to curb the rapidly rising construction costs.⁴⁹

Finally, plans call for a continuation of the policy of narrowing the gap between wages of collective farmers and those of state sector employees working in industry, agriculture, trade, and other branches of the economy. Wages of collective farmers are to rise by 25 percent compared with 18–22 percent for state workers. By 1990, the real income per capita (including social benefits and income from private plots) of the two groups is supposed to be approximately the same.

The regime is also continuing to emphasize investment in farm machinery production. Planners have allocated 12.3 billion rubles for this purpose, nearly two and one half times the amount allocated for 1981–85.⁵⁰ The regime is counting heavily on a new quality control program—the state acceptance service—to prevent factories from shipping defective machinery to farms.

The direction of future labor policy has also been indicated in three decrees issued since Gorbachev's advent to power.⁵¹ The first

⁴⁷ *Pravda*, February 26, 1986.

⁴⁸ A party-government decree taken in January 1986 provides details of the tasks that consumer cooperatives are expected to carry out. The decree was published in *Pravda*, February 1, 1986.

⁴⁹ *Mezhdunarodnyi sel'skokhozyaystvennyi zhurnal*, no. 5, 1986, p. 3.

⁵⁰ *Ibid.*, p. 3.

⁵¹ The decrees were "On Further Improving the Management of the Agro-Industrial Complex" (*Pravda*, 23 November 1985, pp. 1–2); "On Further Improving the Economic Management in the Country's Agro-Industrial Complex" (*Pravda*, 29 March 1986, pp. 1–2); "On Urgent Measures to Enhance Labor Productivity in Agriculture on the Basis of the Introduction of Rational Forms of Labor Organization and Financial Autonomy" (*Pravda*, 19 December 1986, p. 1).

decree, issued in November 1985, established the USSR State Agro-Industrial Committee (Gosagroprom) by merging five ministries, one state committee, and elements of three other ministries. This decree did not directly address the issue of labor productivity on farms. The next decree in March 1986, however, had numerous provisions dealing explicitly with incentives for farm workers. First, the decree sought to strengthen self-financing of farms by tying the size of the wage fund directly to the planned gross value of output.⁵² The norms used to determine the wage fund were to be set so that wages did not increase faster than labor productivity. Should this occur, cost overruns were to be made up out of bonus funds. Next, the decree called for all subunits of farms, processing enterprises, and other organizations to use collective contracts and self-financing. Family and personal contracts were encouraged. Also, farm leaders were empowered to allow workers in contract teams to keep 25 percent of above-contract production—a bonus-in-kind—not to count toward wages. Finally, the system of paying cash advances during the growing season with a post-harvest payment depending on actual production, was expanded to include managers and professionals working on farms.

Many of the provisions of the March decree merely tinkered with the existing system of wages and bonuses and were thus similar to such provisions in earlier decrees. For example, state farm directors were authorized to increase wage rates up to 150 percent depending on crop yields and livestock productivity as long as overall wage costs per unit of output did not go up. Formerly, these wage rate increases were limited to 30 percent. Similarly, the portion of cost savings that can be channeled into bonus funds was increased. Finally, the March decree gave a boost to private housing construction by allowing state farm directors to pay for half of construction materials purchased by workers for this purpose. The decree recommended that collective farms set up a similar program.

The December 1986 decree consisted chiefly of complaints about the unsatisfactory pace of implementation of collective contracts and self-financing on farms. The decree denounced the "irresponsibility and formalism" that are hindering the introduction of these measures and restated the importance of linking the pay of all farm personnel—including managers—to end results. This decree also called for greater use of on-the-job training at farms where collective contracts and self-financing are operating correctly.

VI. OUTLOOK

Realization of Gorbachev's ambitious plans to accelerate economic growth and modernize Soviet society requires, among many other things, that the burden of a resource-intensive farm sector be sharply reduced. Although a "radical breakthrough" is needed, the prospects for achieving it in the 12th Five Year Plan are not

⁵² Self-financing requires enterprises to finance their operations out of their own revenues. If it is properly implemented, self-financing creates positive incentives for producers and is a prerequisite for managerial autonomy. To date, self-financing has been implemented largely in name only, and is undermined by the continuation of such practices as writing off debts of unprofitable farms, issuing cheap bank loans, and paying high minimum wages. The system of central allocation of industrial goods and the price system also weaken self-financing.

bright. The outflow of labor from agriculture will continue, but the rate is likely to be well below that planned. Hence, this source will continue to make a negligible contribution to overall economic growth during the period.

Sharply accelerated release of labor from agriculture would require a breakthrough in raising productivity of farm workers. The programs now in place, or planned, that are intended to bring this about seem inadequate to the task. In particular, Gorbachev's ambition to create the "new agricultural worker" will remain as distant as has the longstanding goal to create a "new Communist man."

Although some progress may be made, the many measures intended to accord priority to improving the living conditions of farm workers—and thus hopefully their work attitudes—are likely to founder on the shoals of insufficient investment. The allocation to housing, for instance, will surely be insufficient to meet the construction target, given that the cost per square meter has been rising for decades at more than 3 percent per year. If additional funds are made available for housing, they will probably have to come at the expense of allocations to other rural infrastructure since other parts of Gorbachev's modernization program will be in need of more investment than intended. Thus, rural amenities are likely to remain few and their quality poor relative to those in cities. Finally, the largely do-it-yourself approach to increasing the quantity of goods and services for farm people is hardly suited to upgrading their quality. Imposing such tasks on farms adds to their burden and diverts them from their primary mission—efficient farming. Hence, in 1990, as now, the quality of rural life is hardly likely to appeal to the best and the brightest of rural youth.

Neither is a near-term breakthrough in the cards in relieving the drudgery of most farm jobs by mechanization. The regime is counting on more investment and strict quality standards to raise the quality of agricultural machinery. Modernization, however, is a lengthy process. The state acceptance service, furthermore, is being undermined by industrial enterprises discovering new ways to sidestep quality control.⁵³ Without stronger economic ties between farms and producers of machinery, there is likely to be only slow progress in improving the quality and assortment of farm machinery.

The leadership clearly is pinning its hopes for an upsurge in farm labor productivity on the mandated adoption of various forms of the collective contract, including family contracts and the so-called "intensive brigade."⁵⁴ Although collective contracts have had some success in raising yields and lowering costs where they have been implemented fully, there are many conditions that must be met before widespread, successful use can occur. First, suppliers of machinery and other inputs must be made more responsive to farm needs so that farms and collective contract teams have the goods and services they need to carry out farm operations on a

⁵³ A particularly revealing article on this subject was published in *Sovetskaya Rossiya*, 6 June 1987, p. 1.

⁵⁴ There are several variants of the collective contract. Family contracts are intended to bring the kinds of incentives that exist in private agriculture into the socialized sector. Intensive brigades are merely very small contract teams—usually two or three machine operators.

timely basis. As long as industrial enterprises are rewarded for fulfilling gross output plans and machinery is rationed to farms, however, the link between farms and suppliers of industrial goods is likely to remain weak. Although the regime has announced its intention to solve this problem by revamping the wholesale trade system, nothing has been accomplished yet. Second, the rules, regulations, and legal procedures for formulating collective contracts must be simplified if many thousands of these contracts are to be concluded each year as planned. Also, workers must be trained to manage the entire production process and not simply one phase of it. Finally, there must be willingness on the part of all concerned to tolerate year-to-year fluctuations in the incomes of farm workers.

In line with similar schemes in industrial enterprises, Gorbachev's plans call for expeditious extension of the principles of self-financing to Soviet farms. Doing so will be a tall order, for enormous differences exist among farms in growing conditions, product prices, capital stock, and profitability. In 1986, a good year for agriculture, over 6000 farms operated at a loss.⁵⁵ Moreover, even if formally implemented, self-financing can do little more than encourage farms not to waste the inputs that have been allocated to them. It is unlikely to produce the intended efficient resource allocation, given the dubious nature of product prices for inputs and output and the limited real autonomy that farms have. Even under allegedly more liberal rules, farms remain subject to the dictates of imposed output targets for much of their output and have no real choice about supplies of materials and investment goods. Interference by regional officials in day-to-day farm operations continues to undermine even the limited efforts made thus far to improve incentives for farm workers and managers. In January 1987, party secretary Nikonov complained that "leading officials . . . who are personally responsible for the improvement of the economic machinery in the agro-industrial complex, sometimes have only a superficial knowledge of the new provisions and, at times, display an irresponsible attitude toward their implementation. This is the only way to explain the neverending flood of paperwork, demands, and instructions accumulating on farms."⁵⁶

Prospects are dim for any regional redistribution of farm labor. There have been no substantial new incentives to foster migration from the southern, labor-surplus areas to northern areas. If the leadership pursued such a policy, it would be costly and would encounter strong resistance from sending regions and from those that would have to absorb large numbers of new migrants with radically different cultural, ethnic, and educational characteristics. Expansion of industry in Central Asia could absorb excess labor. In fact, the 12th Five Year Plan calls for above-average growth in most republics with fast population growth. Investment patterns, however, are not shifting to support industrial development in these areas. Statistics for the 12th Five Year Plan suggest that, on a per capita basis, the relative investment position of the RSFSR will continue to rise and that of most of the other republics will

⁵⁵ *Pravda*, 18 January 1987.

⁵⁶ *Pravda*, 25 January 1987.

fall, especially those in Central Asia. In general, there is little sign of any consistent policy to effect the transition of released rural labor into the industrial and service sectors.

COMMENTARY

By D. Gale Johnson*

Two years after Mikhail Gorbachev became General Secretary of the Communist Party of the USSR it is uncertain what major agricultural reforms will be instituted. In fact, as time goes on it becomes even less certain that there will be significant and productive reforms in agriculture or in the sectors of the economy that serve agriculture. Many may consider this to be a too pessimistic view of the prospects for Soviet agriculture. But I think that a careful reading of the Doolittle-Hughes and Gray papers supports these largely negative conclusions.

What would it take to have a reform of Soviet agriculture and the supporting sectors that would make possible output growth with declining real costs of production? At least the following actions are required:

a. A significant decentralization of decision making to the farm level, removing most of the influence of the bureaucracy over farm plans and decisions. This was a major aspect of the successful Hungarian and Chinese agricultural reforms.

b. Reforms of both farm output prices and the prices of resources used by farms so that when decision making is decentralized the farm managers will be faced by price signals that reflect the worth of a commodity or service to the economy; decentralizing decisions with the present price structure would generally result in an inappropriate output mix and misuse of many inputs.

c. The input supply sectors and the marketing sectors must produce products and services demanded by the farms; these sectors should become the servants of the farms, so to speak, rather than enterprises that dictate conditions to the farms.

d. Incentive systems must be devised for the farms, the input supply enterprises and the marketing agencies so that a productive contribution will be rewarded commensurate to its contribution to real output and failure to perform at an adequate level is punished by loss of income or job. For the farms there needs to be much greater flexibility in determining incomes and wages than is now the case.

In addition to these reforms, there needs to be an appropriate level of investment in the rural infrastructure—roads, schools, cultural institutions, retail and service establishments—and a rural consumer supply sector that equates supply and demand at reasonable prices. If farm people cannot spend their incomes for goods and services that they want, it would do relatively little good to make money pay commensurate to productivity. Why work more

*Professor of Economics, the University of Chicago.

and harder if you obtain little satisfaction from the reward? The emphasis in the 1982 Food Program on increasing the importance of payment-in-kind indicates how much the value of money in rural areas must have been depreciated due to the shortcomings of the consumer goods supply sector.

Doolittle and Hughes did not organize their paper along these lines, but they say something that is relevant to each point. In particular they state:

(Gorbachev's) proposals . . . dodge the very difficult and controversial issues of major reforms in prices, incentives, and decisionmaking latitude for farm managers, and therefore are not sufficient to achieve productivity gains large enough to reduce costs, subsidies and the flow of resources to food production.

One of their most important discussions relates to the limitations of self-financing unless there is radical reform of input and output prices:

Most of all, self-financing has been undermined by the existing price system. Specifically, rigid, centrally set prices do not cover costs for some farm products and cannot take into account the impact on costs of constantly changing growing conditions and the extreme differences in soil and climate that exist from region to region.

The last part of the second sentence is particularly relevant when the state establishes plans for each farm and does not permit farms to use their resources to the best advantage of the farms.

At the 27th Congress Gorbachev promised what had been promised before, namely that farms would be given stable annual procurement quotas for the entire plan period. What the farms produced in excess of the quotas they could keep or sell as they saw fit. But the decree that must have been under preparation as he spoke at the 27th Congress did not carry out either of these renewed commitments for most farm products. Starting in 1987 oblasts and krays are to receive procurement quotas for deliveries at the national and republican levels, but procurement targets for farm products to be used locally are to be set at the oblast and kray level. Who will watch to see that the local procurement quotas do not entirely remove the ability of the farms to do with their excess products as they see fit? And this is apparently what was intended by the decree, namely that local officials were now to have considerable say about the procurement and marketing of farm products. The farms may in fact have lost discretion as a result of the decree; at least, it is most unlikely that they will now be less subject to the whims and fancies of bureaucrats—it will only be a different crowd. Giving authority over procurement quotas to local officials means that Gorbachev's commitment on the fixity of procurement quotas will be violated.

As Doolittle-Hughes make abundantly clear, Gorbachev's reform efforts have so far had very limited effects and some of the reforms, especially several included in the 1986 decree, will create new distortions in an arena that is beset with distortions. The slowness and limited nature of the reforms should be considered in the context of Gorbachev's six years as the Secretary of Agriculture for the Party. Thus agriculture is not a new area for him and one might have expected him to have had a reasonably coherent set of reforms already to begin implementation. Such seems not to have

been the case. Or if he has had such a menu, he has not been able to convince his colleagues of its merits.

Barbara S. Severin's paper documents a series of modest improvements in animal feed supplies, in reducing the dependence of livestock production upon concentrates and in increasing total livestock production. She does not find evidence of improvements in the amount of meat produced per unit of feed. In particular the improvement in feed supplies has resulted from partially overcoming the long neglect of roughage production. Hay yields have long been abysmally low and it has surprised many observers, including this one, why efforts had not been made to increase such yields since the alternative was the expensive process of importing huge amounts of grain.¹

The author presents evidence that under reasonable assumptions for the remainder of the 1980s concerning the grain production, modest increases in roughage output, some improvement in protein content of animal rations, and the reduction in seed requirements due to the increased use of fallow, Soviet grain imports might be of the order of 20 million tons annually. If growing conditions are relatively favorable, some further improvements in roughage supply and feeding efficiency might result in nil imports by the end of the decade. The author doesn't quite say this, but this is a reasonable interpretation of what is said in section IV. But under less favorable climatic conditions, comparable to the 1961-65 period, grain imports might grow to "levels even higher than the 40-million-ton average of 1981-85."

Kenneth R. Gray presents a rather ambivalent view of the recent policy changes, or lack thereof, under the Gorbachev regime. His analysis of the apparent relatively good agricultural performance in 1986 is relatively upbeat. He hints that grain production may well have broken out of whatever mold so depressed yields during the first part of the 1980s. The 1986 wheat harvest was good in both quantity and quality. The reduction in grain area to permit more fallow, something that some of us have been recommending for more than two decades, was associated with the second highest grain yield in history. The increased grain yields may have been the result of the application of the program of intensive technology. This program is apparently nothing more than applying an adequate amount of modern inputs at more or less the right time in the right way. Gray is rather skeptical that there is any basis for the claim that such an approach actually increased grain production by 16 million tons in 1985 and by 24 million tons in 1986. But he does believe there were some positive effects.

But most of the rest of the paper is a litany of failures or inability to seize opportunities. Gorbachev's policy changes seem not to have improved the system of supplying inputs to agriculture; the collective contract has not been successful in relating reward to productivity of effort; the 1986 decree that was touted as the forerunner of a new marketing system for farms, one that would permit farms freedom to dispose of a significant part of their output, seems not to have been applied to any significant degree.

¹ D. Gale Johnson and Karen McConnell Brooks, *Prospects for Soviet Agriculture in the 1980s* (Bloomington: Indiana University Press, 1983), pp. 44-47 and 103-104.

Finally, the agricultural reorganizations such as the RAPOs seem not to have functioned as originally claimed or officially expected.

Gray's apparent uncertainty is not unexpected; it is shared by most other observers of the Soviet policy scene. What is clear is that it is very difficult to carry out reforms of Soviet agricultural policy. But we shouldn't find this too surprising. We need look only at our own agricultural policy situation. Efforts at reform that were proposed or considered in 1984 and 1985 came to nought. True, the 1985 farm bill lowered farm price supports in an effort to move more output into international markets and less into stocks, but the other features such as high and rigid target prices and supply management efforts that have little effect on international market prices because our output reductions are offset by increased production elsewhere were unchanged. Reform is difficult everywhere.

I have little to say about the excellent paper by Ann M. Lane, Ruth M. Marston and Susan O. Welsh. It is a comprehensive analysis of the nutritional values to be found in the Soviet food supply. The caloric value of the Soviet food supply is clearly adequate. The supply of most other nutrients has been improving and is now generally adequate, with the possible exception of calcium. The continued existence of rickets implies that there are serious Vitamin D deficiencies among some segments of the population. This is quite remarkable since it is relatively easy to provide adequate supplies of Vitamin D either through fortification of milk or other common foods or by provision of pills. The authors note that there is relatively little fortification of foods.

COMMENTARY

By Karl-Eugen Waedekin*

How much of a real change is going on in Soviet agriculture, and to what degree will the changes actually improve its productive performance, which is targeted as the first sector of the economy to change profoundly? What did Gorbachev have in mind, when he spoke of a "radical reform" at the XXVIIth Party Congress? A definition of "reform", on which everybody agrees, will hardly ever be possible, but a clearly defined operational term is needed in order to measure statements of observers against what they mean when using or rejecting the word "reform". Such a definition cannot be offered here in what is merely a commentary, it requires a wider discussion, which has not started yet, but should be initiated.¹

Of more immediate interest are the likely consequences for world food markets in general and for U.S. agricultural exports in particular. Beyond that it is of great interest to almost any country, East or West, whether the Soviet economy will be made able to resume its former growth trend, especially in its critical food sector. It does not seem entirely clear, after all, what and how much of Moscow's present agrarian policy is new and of Gorbachev's making. It is true, he has been responsible on the Central Committee for agricultural affairs since summer or fall, 1978, but the basic outlines of the 1982 Food Programme were already laid down at the July, 1978 Plenum of the Central Committee and must have been worked out some time before. Gorbachev's sticking to the Food Programme at least in its formal wording does not prove his earlier co-authorship and is contradicted by his scaling down of the main output goals. The Programme referred to 1986-90 output averages, which now are postponed to the end year 1990 (and beyond). This is more than a minor change, because less strain in the material plan goals means more flexibility on lower levels, and although the goals still look over-ambitious for grain, meat, sugar beet and oilseeds, they seem achievable for a number of other products.

By now it has become futile to put personal tags on Gorbachev's individual steps, he clearly identifies himself with the current policy. The various measures and announcements of measures have become so numerous that one can hardly keep track and evaluate them. That is why overviews like those in the present chapter are highly welcome.

*University of Giessen.

¹ A valuable attempt was made ten years ago by Morris Bornstein in the 1977 JEC volume *East European Economies Post-Helsinki*, p. 125. He found no or few followers, though.

Were 1985 and 1986 really "good years" implying success under the new supreme leader? K. Gray with some reason suspects that the 1986 grain harvest results are overstated. Indeed, at least procurements seem to have been enforced to a degree that does not bode well for the farms in 1987—and perhaps beyond. This is what a known Soviet writer on agrarian affairs has to report:

"In 1986 in many places things went as they did in 1952 and in 1962 and in 1972 and in 1982 also. Procurements were carried out . . . without thoughts about tomorrow, without rewards for the best kolkhozes—the grain extraction practically was the same everywhere. . . . A party functionary of Gor'kii province writes me in a letter: 'This winter the feed supply is poor in the southern regions, where everything "burned" (i.e., under the drought) and in the northern regions, where an unheard-of harvest was achieved.' This equality in poverty was brought about by the old Borzov (a negative character in V. Ovechkin's *Raionnye budni* of the late Stalin and early Khrushchev years) method of additional assignments (Russian: *zadanie*), those assignments which were forbidden by the decree . . . (of late 1985) and therefore in a way were not made public (Russian: *neglasny*, in contrast with Gorbachev's demand for *glasnost*), and so they were issued only orally. . . . They (at the county and farm level) do not know that we (at the province level) receive the orders from Moscow, and by telephone at that."

"The grain sales: first a plan, then an assignment (*zadanie*), then an assignment plan, then a first additional plan, then a second one. . . ." A man in a responsible position at Agroprom, this already from Moscow: ". . . I was shouted at from above, and I transmitted to below: Give, give! The local people are irritated to the utmost, the promises they had heard were entirely different, after all. . . ." ²

A visible success in the first full agricultural year after Gorbachev assumed supreme power was highly desirable, after all. And one thing is sure: As before, the local (county, province) authorities are held responsible for success or failure in their territory.

It is not difficult to guess at the effects, both in the past and in the future, of such a procurement campaign on the motivation of farm managers and on the incomes, including those in kind, of the workers who allegedly now are paid according to their productive performance, not only that of the past but also of coming years. Whether Gorbachev knew and approved the rigidities of the 1986 procurement campaign, or whether it was started by over-zealous bureaucrats below him, yet on high levels, will not so soon become known. And the very fact that the criticism could be published in an influential monthly may imply that it is part of the efforts to change the ingrained system, especially so as similar complaints about procedures contradicting the highest level rhetoric in other branches of the economy, too, have been published. On the other hand, it may also signal that most of the "perestroika" has been abortive so far. Gorbachev himself used to speak of a whole generation needed to bring it about.

Be that as it may, it seems quite likely that the above description of the 1986 harvest campaign indirectly points at an overstatement of the actual output. Procurement quantities naturally bear a certain percentage relationship to production results. Although those percentages are not comparable (output is in "bunker weight", procurement in net weight of grain of stipulated conditions), and although the share tends to increase with growing quantities being processed by the feed industry, a sudden jump upwards of the percentage would be a negative phenomenon. Enforcing overly great

² A. Strel'ianyi, *Novyi mir*, no. 12, 1986, pp. 239-40.

procurement quantities, the public administration, from the local up to highest levels, might feel induced to overstate the output. Otherwise, the procurements would be seen to be unjustified, and subsequent statistics on both output and procurements would reveal the unhealthy character of the 1986 campaign.

Agriculture in the Soviet as in any industrial economy depends for its successes or failures not only on itself but heavily also on the sectors supplying inputs and putting demands on it. As to the demand side, it is correctly stated in the present chapter that "the Soviet food supply on an average per capita basis has long been generally adequate from a nutritional point of view", and that the present critical situation rather is one of an excess demand over the supply of the better kinds of food. To the effects of rising incomes, low food retail prices and of the Soviet citizen's comparison of his own with Western and even East European food availabilities, yet another cause has to be added, which is external to agriculture, namely the inadequate supply of consumer goods and services by the non-agricultural sectors of the economy. There would be less demand for food—even at given prices—if the Soviet citizen were able to spend more of his income on a broad, high quality assortment of such other goods—from fashionable clothes to automobiles, well equipped housing, foreign travel, not to speak of numerous small things of daily life, which so often simply are not to be had.

At the same time, one may ask whether from a nutritional point of view it is a disadvantage for the Soviet citizen that he consumes less fat and cholesterol than his U.S. counterpart. In spite of the striking increase of fat consumption since 1970, which far exceeds that of protein, its absolute level does not seem alarming. A comparison with industrializing Europe of earlier stages shows this to be rather a typical pattern. In parallel, it now is the protein of animal origin, largely meat, to which consumer demand turns, and this is where the Soviet food economy mainly fails. Under Gorbachev, this shortcoming has been approached from the side of raised producers' incentives as well as from that of demand by shifting part of the wholesale purchases, processing and retail sales of meat and meat products to the stores of the consumer cooperatives, where prices are higher than in the state system. The effect has already been taken for granted by a reporter of "Sotsialisticheskaiia industriia" of March 15, 1987, who remarked:

Remember how proudly we said that we have the least expensive cured sausage in the world. Pride there was, but not enough sausage. Nowadays, after introducing the cooperative prices, its production is more and more increasing.

The main thrust of that article, however, was directed at the indirect raising of bread prices by introducing allegedly better and more expensive kinds of bread, which not all consumers consider really better, while the old, less expensive kinds have become unavailable in many stores.

The inconsiderate wastage of the actually very cheap bread, or its being fed to livestock, is only the feed grain side of the excess demand for, or insufficient supply of, meat. Together they form the "Livestock Feed Dilemma", so competently dealt with by B. Severin. It has to be emphasized that both problems are of a qualita-

tive rather than quantitative character. If harvest and post-harvest losses of Soviet grain and other feed could be reduced to an acceptable percentage, and the feed conversion ratio improved, production would be sufficient at the present meat consumption level. No sizable Soviet imports of feed and animal products would be needed on the annual average, or else meat consumption could be raised far above the present level.

The Soviet leaders obviously are aware of this. While continuing to press for increased output of grain and other feed, they also are eager to see the livestock sector improve its feeding efficiency. In fact, some improvement has been discernible in recent years. Calculated in physical meat output units (one kg of meat equalling 0.167 kgs of milk, 3.6 kgs of wool and 20 eggs), livestock production during 1983-86 expanded by a respectable annual average rate of 3.6 percent (more than doubling the 1.7 percent of 1971-80), while the consumption of feed (in oats units, according to the 1985 statistical annual) increased only by roughly 1.9 percent per annum during 1980-85 (no more than it did during 1971-80). No less important, for achieving this, the number of cattle units (derived from the Soviet data on feed consumption per unit), increased by only 0.9 percent p.a. during 1983-86 (as against 1.6 in 1971-80). Thus, output per feed and yet more so per livestock unit has remarkably improved. At the same time the share of grain in total feed consumption has declined. In view of the great share of beef and veal (44 percent) in total meat output and the still low productivity of most Soviet cattle, such a decline was tantamount to a normalization.³

Most of the planned increase of meat and other animal output comes from the predominant collective and state farm sector, and the recent improvements, outlined above, seem for the most part to have been brought about there. They are likely to continue. According to UPI of March 11, 1987 V.S. Murakhovskii is reported to have said in Paris that within five years—by the end of 1991(?)—the Soviet Union would no longer need food imports. This may be over-optimistic, in particular for years of unfavorable weather, but a sizable reduction of feed imports is most likely. In the present writer's opinion it might even amount to more than in B. Severin's "scenario" and reduce grain imports to between 10 and 15 million tons by 1990 or 1991. It has to be added, though that the increased imports of phosphorous rock or acid are part of such an outlook, thus substituting for grain imports.

The fact that in the present propagation of "contract" farming and its remuneration considerable emphasis is put on part-payment in kind (quite often feed) testifies to the government's optimism regarding a contribution of private livestock owners to the targeted increase of livestock production. Among other things, it was found that the "family links" (cf. below) require considerably less feed per meat output unit than the usual public farm sections.⁴ Private plot production also seems to have been part of the recent improvement, although its contribution cannot be assessed exactly in quantitative terms.

³ Figures derived from *Narodnoe Khoziaistvo SSSR v 1985 g.*, Moscow 1986, pp. 240, 251.

⁴ G.I. Shmelev, *Sotsiologicheskie issledovaniia*, no. 4, 1985, p. 16/17.

Strikingly, the official Soviet statistics show a higher share of the private sector in the overall output of meat, milk, wool and eggs than in total livestock numbers. This may in part be due to the fact that the annual livestock numbers refer to the end of the year, when private owners tend to have sold some of their animals to the public sector and in this way contribute to output, which statistically is attributed to the public sector. Such sales apply less to cows, which usually are kept throughout the winter. And while calculation of overall livestock herds in cattle units contains some uncertainties, the development of cow numbers permits a more precise comparison with that of milk output. According to the statistical annuals,⁵ private plot producers owned an almost unchanged percentage of overall cows numbers in 1980 and 1985: 30.5 and 30.7 percent, respectively. Their contribution to overall milk output, however, declined from 29.8 to 23.0 percent in those same years. It is true, milk yield per cow seems to have increased more slowly in the private than in the public sector, but this differential explains at most only half of the declining share, if not less. In fact, at least 6 million tons of privately produced milk seem to have been accounted towards socialized output in 1985. This fits in with the figure given by Sidorenko for intra-farm sales in 1983.⁶

A recent (sociological?) investigation in Belorussia revealed a similar discrepancy: Kolkhoz members, workers and other employees held one quarter of overall cattle units but produced one third of the total milk and meat output and half of all eggs.⁷ (For wool in Belorussia, the share is smaller, it has to be added.)

On the other hand, the explicit policy of channelling an increasing part of private output through public marketing outlets, instead of letting it be sold on the free markets, is likely to dampen the motivation of private plot owners to increase their production. Without such motivation, socio-demographic factors—aging and decreasing rural population in the main livestock regions of the country—will act towards a decline of their production, and local obstructionism may play an additional negative role. This does not apply to the growing numbers of urban and suburban producers of vegetables and fruit, whether fully private or organized in "collective" associations. The mid- to long-term results of the present policy in this field remains to be seen.

The overall value of private agricultural output on the 1981-85 average, compared to 1976-80, increased even slightly faster than that of the public sector. Apart from animal production, the sector in 1985 also contributed three fifths of total Soviet potato production, three tenths of other vegetables and, in 1984, almost three fifths of fruit.⁸ In absolute terms, these quantities have remained almost stable. The kinds of production differ by regions and population segments. The agricultural population of the Ukraine, Belorussia and the Central Black Earth region of Russia consists predominantly of collective farm members, and it is mainly they who raise dairy cattle and calves for veal. The holdings of many workers on

⁵ *Narodnoe khoziaistvo* . . . , op. cit., pp. 236-45; cf. *Statisticheskii ezhegodnik stran-chlenov SEV*, 1985, p. 107.

⁶ V. Sidorenko, *Sel'skaia zhizn'*, January 4, 1985, p. 3.

⁷ V. Tarasevich, V. Leshkevich, *Ekonomika sel'skogo khoziaistva*, no. 8, 1986, p. 31.

⁸ *Narodnoe khoziaistvo* . . . , op. cit., pp. 186, 258.

state farms (most of whom are former collective farmers) are similar, but on the average smaller, most likely with less dairy cattle. The urban and suburban residents concentrate mainly on vegetables and fruit. In overall value terms, less than half, perhaps even less than one third of total private agricultural production derives from collective farm households,⁹ and their share will continue to decline. So a very sizable private contribution to the growth of Soviet livestock production can hardly be expected. There may be some increase in private pig fattening,¹⁰ but the main growth potential is in vegetable and fruit production of non-kolkhoz plot holders and gardeners.

The field where reality is most likely to be distinguishable from rhetoric is investment. Already during Brezhnev's last years, the times when agriculture received an overproportionate share of total investment in the Soviet economy ended, and Gorbachev did not revive them. The investment growth rates on five-year averages and for 1985 compared to 1980 look as follows:¹¹

Growth of investment (percent)	1971-75/ 1966-70	1976-80/ 1971-75	1981-85/ 1976-80	1985/1980
In the economy at large	+41	+28	+17	+19
In agriculture	+67	+29	+9	+6

For 1986, the annual statistical report stated: "No basic changes in the investment process were effected during the past year", without revealing data for agriculture or the comprehensive food sector.

Although the share of agriculture did not increase, one might assume, on the basis of many public statements, that the shares of its upstream and downstream links in the "Agro-Industrial Complex" (AIC) did. However, for 1985, they are not comparable to those for the two preceding years, and those alone do not form a sequence sufficient for conclusions. However, data on investment by differently defined categories within the AIC are available (loc. cit.):

	1971-75/ 1966-70	1976-80/ 1971-75	1981-85/ 1976-80	1985/1980
Percentage growth rates of investment in agriculture proper (excluding private and non-farm) in production objects	+67	+29	+9	+6
Other (on public farms) ¹	+34	+36	+52	+59
In AIC excluding agriculture proper	NA	+30	±0	² +6

¹ That is infrastructure and socio-cultural construction.

² Assuming, for lack of a figure for 1980, that that year did not deviate from the identical averages for 1976-80 and 1981-85.

The stagnation in the upstream and downstream links turned into growth again towards 1985, but did not exceed that of agricul-

⁹ Soviet estimates or calculations of the share differ. G.I. Shmelev, in a 1985 booklet (*Lichnoe podsobnoe khoziaistvo*, p. 19) gave 49.2 percent. From a statement by V.S. Murakhovskii at a session of the all-Union Council of Kolkhozes a much smaller share emerges (see *Ekonomika sel'skogo khoziaistva*, no. 7, 1986, p. 83).

¹⁰ See the remark of Murakhovskii at the all-Union session of the Republican Kolkhoz Councils, *Ekonomika sel'skogo khoziaistva*, no. 2, 1987, p. 12.

¹¹ *Narodnoe khoziaistvo* . . . , op. cit., p. 367.

ture proper. In view of the 1981-85 zero growth this can at best be called a compensation for previous neglect, not—or not yet—a significant change of investment policy. A declining trend of investment growth in the whole food sector emerges.

Most conspicuous, and real at least in a formal way, was the reorganization of the administration of agriculture and the AIC, known as "Agroprom" and RAPO. On that account, the commentator tends to be more skeptical than the present authors, as far as effects on input supply, production process and processing, storing and distribution are concerned. However, if the transfer of 47 percent of the central apparatus personnel to production jobs and retirement comes true—and so far it has only been announced, no "fulfillment" was made public—this would signify almost a sensation and perhaps refute skepticism.

The reorganization on the farm level under the heading of "podriad" may hardly be called "contract" farming. In view of its actual implementation, "assignment of production tasks" seems a more adequate translation of the term, corresponding to Russian "zadanie", which one also finds in recent Soviet publications on the subject. The more exact counterpart of "contract" would be Russian "kontraktatsiia", which has long existed not only in the relations of the farms with procurement agencies but also in those with private producers.

"Podriad" is a method of labor organization in the first place, and refers to very different phenomena. On the one side of a range of gradation there is the system of wages by brigades, introduced as far back as 1961/62, which is new only insofar as perhaps it is now applied with stricter adherence to its rules and especially to self-accountancy (*khozraschet*). At the other end of the range one finds the very small "podriad" unit, usually a family or kinship group, in heavily labor-intensive production. If combined with a reasonable degree of autonomous decision-making in the production process, such a labor group under certain circumstances may in fact mobilize a productive element of individual, even private interest. Although such units have been given much publicity in late 1986 and early 1987, the future course is not yet clear. At any rate, this variant is promising mainly in largely unmechanized productions and in regions with abundant supply of labor. Elsewhere it could in fact become more than simply a form of organization and remuneration of labor and would come close to autonomous middle-sized farming units. So far, nothing indicates that this might be acceptable under Soviet "real socialism".

Autonomy of sub-units within the large farms requires independence of the farms themselves from imposed plans and from interference by state and party administration—the now proclaimed "samostoiatel'nost", which still is far away. Without true autonomy, however, the problem of measuring and meaningfully remunerating the productive performance of farm workers will remain. Those Western observers who applaud the expected incentive effect in other than autonomous family groups should remember that hired workers on large capitalist farms—and the Soviet brigades are units at least as large—rarely ever receive wages dependent on the overall performance of the farm. The "podriad" is rather based on the principle of the collective farms before 1950, when those

were on average not bigger than the brigades of today and were allowed to pay for work only out of the residual left after all outside obligations and the material production expenses were met. Being applied also in state farms, the "podriad" brings an element of the old kolkhoz system into the state sector. It is true, the residual wage in today's "podriad" brigades is much higher than was possible in Stalin's collective farms and has a guaranteed bottom payment. Yet the incentive to improve the performance may still be small, when and where little more than that minimum can be expected, because the "contracted" plan task as conveyed from above very often is over-ambitious and unlikely to be exceeded.

One of the aims of the "podriad" system is to use labor more efficiently, either by diminishing its input or by increasing the output per worker. Complaints about shortage of labor in agriculture are recurrent in Soviet specialized and general publications, and some Western observers accept them at face-value. Yet is it possible at all to speak of such a shortage where there are—on the all-Union average—twenty workers (annual average, not quite full-time) per 200 hectares (500 acres) of arable land? (Including the private plots and their labor, there are even more.) Moreover, the overall labor input—as distinct from the numbers of workers—has virtually remained the same during 1970–85, because the number of days worked per annual average worker increased by 17 percent in kolkhozes and by one percent in sovkhozes, although it still was only 269 days per year in kolkhozes (as against 230 in 1970). As overall gross output increased only slowly after 1978, it did so also per worker.

Low labor productivity "explains" the contradictory phenomenon of great numbers of workers and yet persisting complaints about shortage of labor, but it does not explain the causes. Low labor morale and a bureaucratized, top-heavy management system, which stifles initiative and interest, certainly are important causes. Besides them, however, there are also objective reasons. First of all, shortage or abundance of labor always is a function of the availability and efficient utilization of capital, in particular of labor-saving machinery. Per worker and per acre, Soviet agriculture is equipped with far less capital than its Western counterparts, and the utilization of this scarce capital is sub-optimal, to say the least. Secondly, it is the above-farm planning and management in the USSR, which—against law and repeated declarations of principle—forces on farms a product mix which often is contrary to their natural endowment or optimal combination of factors of production.

A third aspect is that of regional contrasts, which have intensified in recent years. The overall number of annual average workers on kolkhozes and sovkhozes during 1981–85 (five year average) was 24.7 million as against 25.4 million during 1976–80.¹² (It has been pointed out above that the annual average number of days worked was greater in 1981–85.) This apparent small decline of numbers was much greater (1.18 million) in the four Union Republics RSFSR, Belorussia, Ukraine and Moldavia but was in part offset by a rapid growth (2.3 percent p. a.) in the Muslim and the ethnically

¹² *Narodnoe khoziaistvo* . . . , op cit., pp. 283 and 290, and the corresponding tables in the annuals of 1976 and 1984.

mixed Kazakhstan republics. Thus, the all-Union totals hide a considerable numerical decrease in the European and Siberian parts of the country and, percentagewise, a yet greater increase in the Asian parts, where the over-supply of labor continues and even grows. Compared to what has been going on in Western Europe and North America, the speed of the decline in the European and Siberian parts should not be alarming, yet it is compounded by the factors mentioned above in the first and the second place, by the severe seasonability of production under the given climate and an unfavorable age structure in the countryside of much of the area.

The age and job structure is a fourth aspect, which enhances the problems of labor availability beyond what they would seem at first glance. Here again, it is the regional disparities which are at the heart of the matter. There must have been grave reasons which kept the Soviet authorities from publishing the data on age in a rural/urban breakdown and/or for the agriculturally active population of the 1979 census. There is only one annual average worker per kolkhoz household on the average for the USSR, and there must be yet less in most of its European and Siberian parts; in 1957 there had been 1.34; by contrast, the ratio in the Asian parts of the USSR has been much higher, the extreme case being Turkmenia with still 1.65 per kolkhoz household.¹³

The age and the job structure of the agricultural workforce are interdependent. Young people, who have the educational background for handling modern agricultural technology, more often than not tend to migrate to the cities. It is the lack of such trained cadres which greatly contributes to the low efficiency of Soviet farming. In recent years, the problem has rather gained than lost in urgency.

One more of the catchwords, which Gorbachev inherited from his predecessors, is "intensification". In essence it means nothing but modern farming and management methods, as K. Gray rightly points out. It may be doubted whether the concentration of the inputs required for "intensification" on some of the grain area, possibly more in the southern parts of the country, really changes the overall input/output balance. Why should the marginal returns be greater at an already higher input level? A sudden increase of fertilizer, pesticides and herbicides may result in their unbalanced application in "intensive" cropping, or else yet greater imbalance on the remaining "extensive" fields. The often complained of losses of fertilizer during transport and inadequate storages are likely to increase overproportionately with suddenly increased supplies. After all, the deterioration of the N/P/K ratio started already in the 1960s and has shown no sizable improvement after 1975.

Without trying definitely to answer such questions, one other aspect is to be mentioned, that of the degradation of soils. It seems quite possible that the concentrated "intensification" proceeds more along technical and chemical lines than along those of good soil management. The outcome of soil depletion instead of lasting fertility improvement may not relate to "intensive" cropping as such but grows more urgent with it. The specialized Soviet press of

¹³ *Sel'skoe khoziaistvo SSSR*, Moscow 1960, pp. 52, 459; *Sel'skoe khoziaistvo SSSR*, Moscow 1971, pp. 447-49; *Narodnoe khoziaistvo* . . . , op. cit., p. 283.

recent times increasingly pays attention to it. The topical question is whether this process has been going on for a long time and merely is being paid more attention now, or if it has alarmingly accelerated and thereby contributed to the harvest failures after 1978. Quite recently an authoritative person, L. Yermin, chairman of the Gosagroprom of the Russian SFSR, not only sounded the alarm but also explicitly pointed at the rapidly growing extent of the damage:

In recent years the crop farmers of most districts of the republic came across an extremely alarming phenomenon—the decline of soil fertility, the sharp reduction in its humus content. This process acquires a threatening character in individual districts, as the humus content diminished to 1.5 percent during the past one and a half decades. . . . This to a large extent explains the yields, the low returns of mineral fertilizer, the low quality of produce and many other misfortunes in crop farming. Until now, only in a few provinces of the Northern and Northwestern regions and in a few provinces of the Central Region a non-deficit balance of humus continued, just where great quantities of organic manure are being applied. . . . In a word, the problem of humus has now become most urgent, as the size and stability of harvest, the normal functioning of the whole agro-industrial complex depend on its solution.¹⁴

It need not be decided here whether organic manure is the only panacea for all the evils Yermin describes. The relevant part is his statement that declining soil fertility has become an urgent problem in very recent times, which cannot be overcome by mineral fertilizing, and has contributed to the harvest failures. It may be added that the regions he considers most affected are those where most of the "intensification" is going on.¹⁵

Looking back at the most recent years of Soviet agricultural development, one finds a certain recovery. It started already in 1982 in the livestock sector, thanks to the large feed imports when on the consumption side it was supplemented by meat and butter imports. A more dramatic "Gorbachev effect", however, has not become visible yet. Most of what did improve is not necessarily an outcome of recent policy changes, it may as well be traced to factors which have been at work for more than five years, such as weather, the resurrection of a performance-oriented wage system, formation of RAPOs (if at all that had a positive effect), tolerance towards the private sector. What is really new is an intelligent and promising rhetoric which still has to prove that it can be put into practice in a meaningful way. As Stefan Hedlund has pointed out,¹⁶ the institutional system still is basically the same, and it will be difficult not only to reorganize it but also to install new motivation into those working in it.

¹⁴ L. Yermin, *Ekonomika sel'skogo khoziaistva*, no. 2, 1987, p. 30.

¹⁵ Cf. Anatolii Ivashchenko, *Novyi mir*, no. 1, 1986, pp. 151 ff.

¹⁶ Stefan Hedlund, *Crisis in Soviet Agriculture*, London & Sydney, New York 1984, p. 23 and passim.



VII. TECHNOLOGY AND SCIENCE POLICY

OVERVIEW

By George Holliday*

A major element of Mikhail Gorbachev's economic reform program is to promote the modernization of Soviet industry by speeding the rate of technological change. Gorbachev's emphasis on technological change is not new: since the end of the Stalinist era, Soviet policymakers have sought ways to redirect the economy from an extensive to an intensive pattern of economic growth. Given a slowdown in the growth of labor and capital inputs, they have looked to improvements in efficiency and increases in productivity as the major sources of growth in the Soviet economy. Thus, past Soviet leaders tinkered with the economic mechanism and increased the allocation of resources to science and technology, hoping that their efforts would spur productivity growth and revitalize the economy.

If Gorbachev's emphasis on technological change is not new, his activist pursuit of the goals of modernization sets him apart from his predecessors. The paper by Paul Cocks documents Gorbachev's willingness to reform economic institutions, to replace recalcitrant bureaucrats, and to increase sharply the level of investment in new plant and equipment. Such initiatives by Gorbachev evidence a degree of intensity and a sense of urgency that his predecessors lacked. Gorbachev's public statements about economic modernization reinforce the notion that he intends to change rapidly and profoundly the rules of the game in the Soviet economy. He speaks of the need for "radical reform," and suggests that the time for reform is now.

Gorbachev's sense of urgency about reform emanates from the stagnating Soviet economy which he inherited from his predecessors in 1985. Soviet GNP, after growing an average of 5 percent per year during the 1960s and less than 3 percent in the 1970s, averaged only 1.9 percent growth from 1981-85.¹ Soviet economic planners agree that the growth performance of the economy is inadequate to meet the investment needs of Soviet industry and agriculture, the consumption needs of the Soviet population, and the growing requirements of the defense sector. Moreover, the technological performance of the economy, especially in comparison with

* Specialist in International Trade and France, Economics Division, Congressional Research Service.

¹ U.S. Congress. Joint Economic Committee. Subcommittee on National Security Economics. Gorbachev's modernization program: a status report. A paper presented by the Central Intelligence Agency and the Defense Intelligence Agency, March 19, 1987, p. 2.

the performance of Western industrial countries, appeared to some Soviet policymakers to be a growing problem.

The Soviet leadership's sense of urgency about lagging technological performance is perhaps best illustrated by their efforts to stimulate Soviet development of information technologies, the subject of the papers in this section by Peter Nyren, Richard Judy, S.E. Goodman, and William McHenry. Information technologies—microelectronics-based technologies for processing and transmitting information—include computers, semiconductors, and telecommunications equipment. They have proved vitally important in introducing new products and modernizing production processes throughout the economy.

In the industrial Western economies, information technologies are producing what some observers characterize as a new industrial revolution—a revolution that Soviet policymakers are trying to emulate. The revolution, however, is developing much more slowly in the Soviet Union than in the West. Soviet leaders, who have long sought ways to close the technology gap between East and West, are now concerned about falling further behind.

The papers in this section suggest that Soviet concerns about a technological lag in the information technologies are well founded. Judy, for example, estimates that U.S. computer production is about 10 times greater than Soviet production, and that Soviet software development suffers an even greater lag. Similarly, Nyren concludes that, in personal computers, Soviet hardware developments lag those in the West by 4–10 years, and that the Soviet software industry has virtually no experience in developing software for personal computer applications. Moreover, the papers suggest that shortcomings in the volume and sophistication of computer output are jeopardizing key goals in industrial modernization. Goodman concludes that problems in the Soviet computer industry will make it impossible for the Soviet Union to introduce widespread automation into most of its industry and commerce by the end of this century. McHenry finds that the effort that Soviet planners began in 1966 to computerize economic management has fallen far short of its goals. Only 8.4 percent of Soviet industrial enterprises, for example, have automated management systems.

The authors attribute the Soviet lag in information technologies to several factors. Each of them maintains that the lag is in part due to a perverse incentive structure in Soviet industry that rewards fulfillment of output targets set by central planners and discourages risk-taking. Because new technologies may fail to perform up to expectations or, in the short run, disrupt production and reduce output, Soviet enterprise managers frequently shun innovations. Judy sees a fundamental conflict between the rigid Soviet economic system and the imperatives—agility and flexibility—of the new information technologies. Judy also faults an aspect of Gorbachev's modernization strategy—the emphasis on modernizing existing plants instead of building new ones. The implementation of computer-based manufacturing technologies can be extremely disruptive in existing plants. It might be more effective to introduce such technologies in new plants.

According to Nyren and McHenry, special problems in the Soviet computer industry—unreliable hardware, inadequate software, lack

of spare parts for computers, poor technical services and training—discourage the introduction of computers in Soviet industry. There is also evidence that some Soviet political leaders may be obstructing the introduction of information technologies. Nyren notes that the computer literacy program in Soviet schools is being slowed by opposition from officials who consider widespread use of personal computers a threat to the state's monopoly controls over the dissemination of information.

Relatively free markets and decentralized, free dissemination of information have nurtured the development of new information technologies in the West. Must Soviet leaders imitate Western economic, political, and legal institutions to obtain the benefits of a new industrial revolution? Soviet leaders clearly do not think so, according to the evidence presented by the authors in this section. However radical and revolutionary Mikhail Gorbachev's rhetoric, there is little evidence that he wants the Soviet Union to follow a Western path to economic modernization.

Cocks maintains that the model for Soviet leaders is neither capitalism nor market socialism, but the Soviet military economy, which is characterized by centralized planning and management and strong Communist Party direction. Civilian industries, according to Cocks, will try to adopt several institutions and techniques—strong, centralized management; increased long-range forecasting and technology assessment; large, goal-oriented projects to accelerate development of key technologies; new superagencies; and military-style quality control inspections—from the military sector. Moreover, the military industries will contribute actively by developing new technologies for civilian applications and transferring top defense executives into critical civilian jobs.

The analyses of the development of Soviet information technologies reinforce the notion that the Soviet Union is following its own path to industrial modernization. Judy, for example, notes that, whereas developments in the United States tend to respond to market forces, the Soviet leadership tries to focus the development of information technologies to meet key national objectives. Soviet economic planners concentrate their technological resources in such high-priority sectors as the military, central state and party agencies, and manufacturing industries. Goodman concurs that there is a continued commitment to comprehensive central planning. He adds that the computing and communications technologies are an important tool in Soviet attempts to make central planning more effective. Nyren concludes that the Western pattern of widespread personal use of word processing and electronic mail is unlikely to be duplicated in the Soviet Union. The Soviet leadership, he says, envisions an information age that will feature the widespread use of robots and the professional use of desk-top computers by designers, planners, engineers, and researchers.

Will the Soviet leadership succeed in speeding the development of information technologies and modernizing the Soviet economy in a uniquely Soviet manner? The prospects of success, according to the analyses in this section, are limited because the Soviet leadership has avoided the fundamental reforms needed to address systemic barriers to technological progress. McHenry suggests, for example, that Gorbachev's reorganization of the economic bureaucra-

cy may improve coordination and material support for the computer industry. He concludes, however, that the reforms are not sweeping enough to change the fundamental incentive structure which limits the demand in Soviet industry for computing applications. Goodman expects only "islands of advanced industrial automation" to emerge in the Soviet Union, with most of Soviet industry unable to obtain many of the benefits of information technologies. Both McHenry and Goodman suggest that Soviet economic planners can reap, nevertheless, significant benefits through improved data processing. Cocks concludes that the transfer of top defense managers to civilian industries will have only limited positive effects. Soviet successes in military technology, he maintains, are more a result of the high priority accorded to the military than of the military's system of management.

The implication of these analyses is that Soviet leaders may have to contemplate more fundamental economic reforms to spur technological progress. Such reforms, which have been proposed by some Soviet economists, might entail a reduced role for central planning and introduction of market-oriented price reforms. A secondary solution of Soviet problems in the information technologies is increased imports of Western technology and equipment. Nyren suggests, for example, that purchase of a Western-built turnkey computer plant would be the quickest way to start serial production of a reliable personal computer. Barring the purchase of a turnkey plant—and it is barred by Western export controls—large purchases of computers and equipment could help alleviate the shortage of personal computers. More sweeping economic reforms and greater dependence on the West, however, entail significant political and hard currency costs. Soviet leaders will probably need convincing evidence that the ongoing reforms are insufficient before they are willing to bear such costs.

SOVIET SCIENCE AND TECHNOLOGY STRATEGY: BORROWING FROM THE DEFENSE SECTOR

By Paul Cocks*

CONTENTS

	Page
Summary	145
I. Meeting the Technological Challenge	146
II. Evolution of Leadership Strategy	148
III. Overall Strategy Design: Emulating and Tapping the Defense Sector	150
IV. Strategy Directions	155
V. Problems and Prospects	156
A. Strategy Outlook	156
B. The Military Model	159

SUMMARY

The Soviet leadership has made faster scientific and technological (S&T) progress the linchpin of its strategy for economic modernization. They believe this is the key to revitalizing the industrial base, accelerating economic growth, and improving the ability of the USSR to compete with the West.

Toward this end the leadership has mapped out and set in motion a variety of measures aimed at advancing science and technology and making S&T the engine that drives the Soviet economy. While this effort began under Brezhnev, Gorbachev has given it new impetus. He has added other initiatives and has tried to fashion bits and pieces of policies into a long-term "strategy" for S&T progress that has gained momentum and commitment from the leadership for the 1986-90 plan period. These measures span a broad spectrum of activities and actors involved in the research-to-production process, and implementation will stretch into the mid-1990's.

The focus of Moscow's actions is on engineering a high-technology revolution from above. The approach remains primarily "innovation by order" with heavy reliance on the usual methods of political intervention and party control. Indeed, the leadership's model for spurring technological advance is its own military economy in which centralized planning, organization, and management, as well as strong party direction, are the norms. Under Gorbachev efforts to emulate and tap the defense industrial sector—the regime's "best and brightest" assets—are being stepped up, and the process of transferring advanced technology, technique, and talent from defense to the civilian economy is well under way.

* Office of Soviet Analysis, Central Intelligence Agency.

Whether the leadership can sustain the investment and muster the political clout that are needed to ensure implementation of this strategy over the long haul is uncertain, however. Even with Gorbachev's and the Politburo's complete support, and assuming that initial bureaucratic and institutional barriers can be overcome, the ultimate success of this approach to modernization is not assured. Its key aspects reflect the political and ideological biases of the existing economic system, and its momentum stems from the establishment's desire to avoid the fundamental systemic reforms that may be required to meet S&T goals. The obstacles blocking rapid or easy advance are formidable. Not only must the latest science and technology be mastered but long-lived cultural conditioning, social attitudes, and an incentive structure generally inhospitable to innovation must be changed. Dealing with "human factors" will be at least as difficult as developing technological hardware.

Finally, the planning and management approach of the defense sector is not really a viable model for the economy as a whole. This approach has inherent limitations: priorities cannot be extended too far without diluting their effectiveness, and high-level political intervention is similarly constrained. Space management technique and technology, moreover, cannot be transplanted easily to the civilian side, and they will not work there with equal success, as demonstrated by the experience of former defense industrial managers who have recently been reassigned to critical civil sector jobs. Indeed, some defense industry workers are complaining that it is easier to deal with defense matters and to go into space than it is to build modern spinning looms.

I. MEETING THE TECHNOLOGICAL CHALLENGE

International and domestic pressures are forcing the Soviet Union to concentrate on accelerating technological change. Kremlin leaders recognize that the USSR seriously lags the West in reaping the benefits of the "new industrial revolution," based on computers and electronics, and are concerned that the inability to move emerging critical technologies quickly into production and use is a major brake on development in both the defense and civilian industries. Without a major refurbishing of the country's industrial base, they realize that it will be increasingly difficult to raise living standards, improve economic performance, and meet the weapons requirements of the 1990's. The Soviets are also apprehensive about US defense modernization efforts and possible technological breakthroughs—especially within the Strategic Defense Initiative—that could upset the military balance. No less important, Moscow is worried that technological dependence on the West and the long established practice of imitating foreign technology and design not only make the USSR and the Soviet Bloc vulnerable to Western political pressures and economic sanctions but also retard, in important respects, the development of indigenous capabilities in science and innovation. As *Pravda* recently explained, the need to speed scientific and technical progress—

is not a conclusion or conjecture engendered in someone's office, nor is it someone's fantasy. Rather it is the toughest, most inevitable requirement both of the internal tasks of socialist development and of socialism's ability to match capitalism. It is in

this that all political, social, military, and strategic problems come together and are focused. It is indeed a challenge thrown down to us by time itself.¹

At the same time, the Gorbachev leadership has made it clear that to meet this challenge requires major policy and institutional change. In a televised speech to workers at the giant Volga Auto Plant in Tolyatti on April 8, 1986, the General Secretary stressed, "To continue making mistakes in technology policy means driving the economy further into an impasse."² In June, he told the Central Committee plenum, "We must counter all attempts at multiplying the former approaches and errors—above all in the sphere of S&T progress."³ Similarly, during his trip to the Soviet Far East in late July, Gorbachev told the Khabarovsk party organization:

There will be no movement forward if we seek the answers to new questions in the economy and in technology by looking to the experience of the thirties, forties, fifties or even the sixties and seventies. This is a different time, with different demands and different requirements.⁴

Addressing a Central Committee conference on machine building two weeks later, senior party secretary Lev Zaykov, who oversees the defense industries, also emphasized, "These tasks are out of the ordinary. And the approaches to them and ways of implementing them must also be out of the ordinary."⁵

In response, the Soviet leadership is moving to make science and technology (S&T) policy the linchpin of its program for economic modernization. The newly revised party program and the basic guidelines for the economy for the 1986-90 plan period and to the year 2000 define more rapid S&T progress as the "main direction" of economic strategy and the "key lever" for rejuvenating the economy, raising productivity, and accelerating economic growth. At the birth of Soviet power Lenin emphasized, "In order to build Communism it is necessary to take both technology and science and put them to work." Reciting this formulation at the 1986 party congress, Premier Nikolay Ryzhkov noted, "Lenin's words are now more relevant than ever."⁶

Toward this end the regime has begun to take a variety of measures to hasten S&T advancement. These initiatives focus on integrating policies on science and technology with general economic policy and aim at making S&T the engine that drives development of the Soviet economy. These policy initiatives cut across various sectors and institutions; focus on political, economic, social, scientific and technical factors; and affect domestic and foreign policies alike. According to Gorbachev, they affect every Soviet person—"from rank and file Communist to Central Committee secretary, from worker to minister, from engineer to academician."⁷

¹ *Pravda*, July 26, 1986. In his speech commemorating the Fortieth Anniversary of Soviet Victory in World War II, Gorbachev emphasized, "Our growth rates and the course of economic competition with capitalism are going to depend largely on how we accelerate S&T progress and the introduction of scientific and technical achievements into the economy." (*Pravda*, May 9, 1985). During his July trip to Khabarovsk, he again noted that "the battle is being fought on the technological front all over the world." (*Pravda*, August 3, 1986).

² *Moscow Television Service*, 1723 GMT, April 8, 1986.

³ *Pravda*, June 17, 1986.

⁴ *Pravda*, August 3, 1986.

⁵ *Pravda*, August 9, 1986.

⁶ *Pravda*, March 4, 1986.

⁷ Mikhail Gorbachev: *Selected Speeches and Articles* (Moscow, 1985), p. 129 and *Pravda*, June 17, 1986.

II. EVOLUTION OF LEADERSHIP STRATEGY

The drive to accelerate economic modernization has evolved gradually and predates Gorbachev's accession to power. The Soviets did not initially view these measures as a coherent program or strategy, nor did they—until Gorbachev—generally label them as such. However, these efforts have increasingly taken on the characteristics of a long-range, broad-gauged strategy that has gained momentum and commitment from the leadership for the 1986-90 Five-Year Plan. Indeed Gorbachev, in a December 1984 speech, used the term "strategy of S&T progress" to describe Moscow's evolving economic course.⁸ Since becoming party leader, he has moved vigorously to integrate these and additional initiatives into what is euphemistically called a "strategy of acceleration," the watchword for his modernization program.

Soviet leaders began to lay the groundwork for this course in the early and mid-1970's—particularly in the defense industries. By the late 1970's, several signs appeared that indicated not only increasing priority for applied science but also the growing involvement of the defense sector in development of civilian technology. The leadership showed its heightened concern by instituting:

- New S&T commissions.*—In March 1979, standing commissions on science and technology were created in both chambers of the USSR Supreme Soviet. Prominent academicians, weapon designers, and military leaders, including the Chief of the Strategic Rocket Forces, serve as commission members. Since 1984 the head of the party's Department for Defense Industries also has been a member.
- Establishment of Science Day.*—In April 1979, Soviet leaders proclaimed, for the first time, an official day devoted to science. The celebration of Science Day—the third Sunday in April—is another acknowledgment of official efforts to mobilize the scientific and engineering community, and also public opinion, behind national objectives.
- New S&T prizes.*—A new set of S&T prizes, awarded annually on Science Day, was instituted in August 1980 for the development of new technology of direct benefit to the economy, and particularly for work performed under national S&T programs. Defense scientists, engineers, and industrial managers have figured among the public nominees and winners of these prizes.

Initially, Brezhnev—probably with help from Dmitriy Ustinov and Andrey Kirilenko (the senior Politburo members overseeing defense and the economy)—began the drive for S&T modernization in the late 1970's. His published speeches sketch its general outlines, and he appears to have been taken with the idea of curing the ills of the civilian economy by patterning it on the defense sector.⁹ He pressed for more long-range planning and S&T forecast-

⁸ M.S. Gorbachev, "Zhivoye tvorchestvo naroda," in *Sovershenstvovaniye razvitoogo setsializma i ideologicheskaya rabota partii v svete resheniy iyun'skogo (1983) plenuma TsK KPSS: Materialy usesoyuznoy nauchno-prakticheskoy konferentsii Moskva, 10-11 Dekabrya 1984g* (Moscow, 1985), p. 22.

⁹ In a part of his memoirs devoted to Sputnik, written just before his death and published in the January 1983 issue of *Novyy Mir*, Brezhnev described the Soviet space program as an "orga-

Continued

ing to guide economic planners, and took some first steps to improve organization and management at Gosplan and the State Committee for Science and Technology. However, though he produced much rhetoric on the "scientific and technical revolution," Brezhnev was weak on implementation and evaded pressing problems. Twice he called for a plenum to discuss S&T problems, but none was ever held. Gorbachev allegedly told a group of Soviet writers in June that "a vast quantity of documentation" had been prepared for such a plenum but ultimately was "buried somewhere or other."¹⁰

Yuriy Andropov gave further impetus to this drive, which also coincided with his efforts to rejuvenate the aging elite. He may have used the constituencies of Ustinov and Kirilenko to help consolidate his power. During his short tenure, their proteges were primary beneficiaries of the cadre changes and policy moves. The three newcomers promoted to the party Secretariat under Andropov—Ryzhkov, Yegor Ligachev, and Grigoriy Romanov—had backgrounds in S&T matters and were strong advocates of economic modernization. In his own speeches to the Central Committee Andropov hammered repeatedly on the priority need to speed up S&T advance, on the decisive importance of framing a unified S&T policy, and on the promise of high technology to bring about "a veritable revolution in the economy."¹¹ Under Andropov, moreover, a joint party-government decree was issued in August 1983 "On Measures to Accelerate S&T Progress in the National Economy."¹²

These efforts slowed under the more conservative Chernenko but began to pick up new momentum during his last months. At a Politburo meeting on November 15, 1984, Chernenko announced:

If we look at the problems of development of science and technology from broader positions, the state of affairs in this sphere arouses some concern. Therefore, the Politburo deems it necessary to discuss at a forthcoming plenum of the Central Committee questions of speeding up S&T progress and of improving its management in all links of the economy. This plenum should be prepared in such a way as to ensure that its decisions provide for a radical change in this vitally important direction of our development.¹³

It is not certain what role the ailing Chernenko was playing by this time in S&T policy. Mikhail Gorbachev, then party "second secretary," already was directing the Secretariat and chairing Politburo meetings in Chernenko's absence. Indeed, it appears that Gorbachev was the principal force behind the preparations for a party plenum on S&T. At the June 1985 Central Committee conference on S&T, Gorbachev gave the most extensive public statement on S&T policy that any Soviet leader since Brezhnev has made. He used the conference to focus national attention on S&T problems and to give new impetus to the Politburo's modernization drive.

nizational prototype" for broader civilian application, and he lamented that the leadership had not been demanding enough of civilian industrial leaders.

¹⁰ An account of Gorbachev's alleged remarks is given by Alberta Jacoviello, "Gorbachev: 'These Are My Enemies,'" in *La Repubblica* (Rome), October 7, 1986.

¹¹ See, for example, his plenum speeches published in *Pravda*, November 23, 1982, June 16, 1983, and December 27, 1983.

¹² *Pravda*, August 28, 1983.

¹³ *Pravda*, November 16, 1984.

Since becoming General Secretary, Gorbachev has made the acceleration of S&T progress the leitmotif of his administration, the centerpiece of his economic program, and a key issue in the consolidation of his power. He is pursuing actions along a broad front, building upon measures begun by his predecessors while adding some new initiatives of his own. He has pressed in particular the pace of cadre and administrative changes to support faster technological advance, extended the educational reform started under Chernenko to higher education, taken new steps to raise technical standards and quality control, and increased the pressure on the East Europeans to join the S&T drive. Above all, he has begun to provide the investment resources and political clout that are needed to really implement modernization.

Indeed, since the 27th Congress officially endorsed his modernization goals, Gorbachev has shifted the emphasis from strategy design to problems of implementation. As he puts it, "The main task now is to transform the energy of intentions into the energy of actions."¹⁴ In face of the formidable obstacles blocking progress, he has moved increasingly toward the view, advanced by numerous Western writers on innovation, that "structure follows strategy," that organization and management structures, to be effective and sound, must adapt to changes in technology strategy. Thus in recent months economic and political "restructuring" has become the second motto of Gorbachev's program, along with "acceleration."

In addition, the General Secretary has underscored four central themes in pressing his program. First, the USSR is at a crucial turning point in its history. At issue is nothing less than the reindustrialization of the USSR, a task that ranks in historical significance with and should be given the "same political ring" as the industrialization campaign of the 1930's.¹⁵ Second, the envisaged transformations are sweeping and unprecedented in their scale. In Khabarovsk, he explicitly equated restructuring with the word revolution.¹⁶ Third, he insists that there is simply no alternative to S&T modernization. As he told the June plenum, "Any other path means a relinquishment of positions, an orientation toward lag."¹⁷ Fourth, Gorbachev hammers on the urgency of action. He dwelt on this theme at the 27th Congress where he also harshly criticized the Brezhnev leadership for its failure to diagnose the mounting problems of economic stagnation and for its lack of will and determination to carry out fundamental change. He also reportedly pressed this point with a group of Soviet writers recently, asking "If not us, who? If not now, when?"¹⁸

The continuing evolution of this leadership course, despite the destabilizing impact of three successions in less than three years, suggests that a consensus exists within the Politburo on at least the broad contours of how to make better use of science and technology in improving the economy. Its growing momentum, first under Andropov and now under Gorbachev, coincides with the rise

¹⁴ *Pravda*, June 17, 1986.

¹⁵ Gorbachev, "Zhivoye tvorchestvo naroda," p. 21.

¹⁶ *Pravda*, August 3, 1986.

¹⁷ *Pravda*, June 17, 1986.

¹⁸ Jacoviello, "Gorbachev: 'These Are My Enemies.'"

of modernizers bent on overcoming the USSR's technological backwardness and its lagging economy. They seem to represent a coalition for change that includes managers and technocrats from the defense sector as well as from the machine building and heavy-industry lobbies of the civilian sector. Although differences of views and interests undoubtedly exist, the coalition is apparently held together by the shared recognition that Soviet military power rests ultimately on the general health of the economy and that the future of both turn increasingly on more rapid progress in achieving higher standards of productivity and reliability through the use of advanced technology.

Further progress in modernization will require firm leadership and political will to overcome entrenched institutional resistance. Far less grandiose economic and management reform efforts under Brezhnev failed, in part, because they were only partially executed and the leadership lacked the resolve to battle the bureaucracy and push them through. Whether Gorbachev and his team is up to this task—and leadership test—remains to be seen, although the early signals suggest he will push hard in this area. As he presses the pace and scope of restructuring, however, implementation of this strategy could become a key issue in the consolidation of Gorbachev's power. It may become even more important if the broad consensus that now exists on the importance of S&T progress for economic growth breaks down and disputes arise over how fast to press technological change, at what cost, and by what methods.

III. OVERALL STRATEGY DESIGN: EMULATING AND TAPPING THE DEFENSE SECTOR

The focus of Moscow's efforts is on engineering a high-technology revolution and industrial revitalization by decree. Its basic approach to modernization relies upon traditional methods of centralized planning and the leadership's direct intervention to spur technological change. Gorbachev has been particularly outspoken on this issue. In a May 1985 speech, he affirmed that the Politburo's strategy is based on Lenin's idea that "socialism must advance in its own way, by its own methods—or, to put it more concretely, by Soviet methods."¹⁹ More recently in Khabarovsk, he noted that "certain people in the West" are hoping that "we would go cap in hand to capitalism and borrow its methods." To the contrary, he insisted:

There is, in the CPSU and in the country as a whole, a unanimous understanding: We must seek the answers to the questions posed by life not beyond the boundaries of socialism but within the framework of our system . . .

In this process of renewal some often see something other than what it in fact contains. They see almost a shaking of our foundations, almost a renunciation of our principles. Our political line is aimed at fully opening up the potential capabilities and advantages of the socialist system.²⁰

The leadership's model for speeding S&T progress is not the capitalist or socialist market economy but rather its own military economy in which centralized program planning, organization, and management, as well as strong party direction, are the norms. The

¹⁹ Gorbachev: *Selected Speeches and Articles*, p. 67.

²⁰ *Pravda*, August 3, 1986.

leadership is looking to the defense industries—its best and brightest assets—to advance the Soviet technical industrial base across the board. Measures it is taking to apply this model to the civilian economy include:

- Improving the effectiveness of bureaucratic levers—the party's sponsorship and oversight of new technology development, and strong centralized management—that have been generally weak in the civilian sphere but are crucial to military technology and defense modernization.
- Strengthening the role of long-range scientific forecasting and technology assessment in economic planning—important management tools used in defense for decades.
- Creating big, goal-oriented projects to accelerate the development of key technologies (lasers, computers, robotics, biotechnology) modeled along the lines of the USSR's nuclear and missile programs.
- Tasking the defense industries to help develop and apply new technology for critical civil sectors.
- Organizing new superagencies at the Council of Ministers, led by deputy premiers and patterned on the Military-Industrial Commission, to oversee and coordinate the work of related ministries.
- Introducing military-style quality control inspections at the most important nondefense industrial enterprises.
- Moving top defense executives with experience in managing high technology into critical civilian jobs. (See List 1).

LIST 1.—DEFENSE MANAGERS TRANSFERRED TO CRITICAL CIVILIAN JOBS

Name	Former position	Current position
Sergey Afanas'yev	Ministry of General Machine Building, 1965–1983.	Minister of Heavy and Transport Machine Building since April 1983 (retired July 1987).
Boris Balmont	First Deputy Minister of General Machine Building, 1976–1981.	Minister of Machine Tool and Tool Building since February 1981 (retired July 1986).
Ivan Silayev	Minister of the Aviation Industry, 1981–1985	Deputy Premier and Head of the Machine Building Bureau at the USSR Council of Ministers since November 1985.
Yuriy Kanyshev	Deputy Minister of the Aviation Industry (about 1982–1985).	First Deputy Chairman of the Machine Building Bureau since December 1985.
Genrikh Stroganov	Deputy Minister of the Aviation Industry, 1983–1984; Director of the Moscow Aviation Technical Institute (1981–1983).	Deputy Chairman of USSR Gosplan (for machine building) since May 1984.
Georgiy Kolmogorov	First Deputy Minister of the Communications Equipment Industry, 1975–1984.	Chairman of the USSR State Committee on Standards since January 1984.
Vladimir Simakov	Head of the Chief Technical Directorate of the Ministry of the Communications Equipment Industry, 1981–1986.	Member of the Collegium and Head of the Science & Technology Department of USSR Gosplan since at least June 1986.
Yuriy Khomenko	Deputy Minister of Communications Equipment Industry, 1983–1987.	Deputy Chairman of USSR State Planning Committee, February 1987.
Nikolay Talyzin	Minister of Communications, 1975–1980	Chairman of USSR Gosplan and First Deputy Premier since October 1985.
Lev Voronin	First Deputy Minister of the Defense Industry, 1979–1980 and First Deputy Chairman of Gosplan (for defense matters), 1980–1985.	Deputy Premier and Chairman of the USSR State Committee for Material and Technical Supply since October 1985.
Aleksey Chubarenko	Deputy Chairman of S&T Council of the Ministry of the Defense Industry (about 1968–1980).	Head of the Science & Technology Department of Gosplan since at least February 1981 (released by June 1986).
Antoliy Reut	First Deputy Minister of the Radio Industry, 1975–1983.	First Deputy Chairman of USSR Gosplan (for general matters) since December 1985.

LIST I.—DEFENSE MANAGERS TRANSFERRED TO CRITICAL CIVILIAN JOBS—Continued

Name	Former position	Current position
Nikolay Gorshkov	Deputy Minister of the Radio Industry, 1974–1986.	Chairman of new USSR State Committee on Computer Technology since April 1986.
Igor Bukreyev	Deputy Minister of the Electronics industry, 1984–1986.	First Deputy Chairman of USSR State Committee on Computer Technology since November 1986.
Boris Tol'stykh	Deputy Minister of the Electronics Industry, 1985–1987.	Deputy Premier and Chairman of the USSR State Committee for Science and Technology, February 1987.

Some of the tactics involved in this approach, like closer central party supervision and goal-oriented programs, probably are also viewed by the Soviets as capitalizing on the intrinsic advantages of a centrally planned economy.

The process of transferring advanced technology, administrative technique, and managerial talent from the defense industrial establishment to the civilian economy is well under way. Several former senior officials—especially from the aerospace industries—now occupy leadership posts at key state committees and ministries as well as the newly-created Council of Ministers' Machine Building Bureau. The civil sectors are being called upon to emulate the efficiency and high technology of the defense industries. The latter are being told to help upgrade and retool the industrial base and to produce more sophisticated consumer goods. Improving the civil side of the economy they are being told is a strategic necessity that will provide the basis for future economic support for the military. While these efforts began under Brezhnev, Gorbachev has given them new impetus. He is increasing the pressure on the defense industries in the 1986–90 five-year plan to support the modernization campaign and consumer goods program. Moreover, he is demanding that their civilian output meet higher standards of quality and reliability.²¹

Gorbachev has singled out the defense sector as a model for emulation in his modernization program. At the June 1985 Central Committee conference on accelerating S&T progress, he praised this sector and emphasized, "In general, it is necessary to follow the example of the defense industries to the utmost. We have begun this work. It has to be continued actively."²²

²¹ At the June Supreme Soviet meeting, Premier Ryzhkov spoke on the leadership's intention to involve all machine building ministries, including the defense industrial ones, in production for light industry (See *Pravda*, June 19, 1986). Gorbachev during his trip to the Soviet Far East and to Krasnodar referred to newly adopted "serious measures" in this direction (*Pravda*, August 3 and September 20, 1986). In July, the Politburo instructed four defense related ministries (communications equipment, radio, and electronics industries and general machine building) to set up during the current five-year plan specialized trade and technical repair centers for servicing television sets, radios, tape recorders, and other electronic products. (*Pravda*, July 25, 1986)

²² As cited in the "Vremya" newscast version of his speech on Moscow Television, 1700 GMT, June 11, 1985. The last two sentences have been omitted from all published versions of Gorbachev's report. Major General A. Gurov of the Moscow Military Academy in November 1985 wrote, "At the June meeting . . . Gorbachev highly evaluated the level and organization of production of the defense branches. He emphasized that their experience will be drawn upon in full measure for the reconstruction of all machine building in the country." (See his article, "The Economic Bases of the Country's Defense Might," in *Tyl i snabzheniye*, No. 11 (November 1985), p. 22.

There are strong indications, however, that Gorbachev's awe of defense industrial managers may have diminished in recent months. He and other members of his team have strongly criticized some reassigned defense managers for failing in their new jobs. This applies particularly to the former "geniuses" of the defense industry Sergey Afanasyev and Boris Balmont—previously the Minister and First Deputy Minister of General Machine Building (spacecraft and ballistic missiles), respectively. Neither has been a miracle worker and succeeded in rapidly restructuring his civil sector domain. At the June Central Committee plenum, Premier Ryzhkov harshly criticized Balmont, who was replaced as Minister of the Machine Tool Industry three weeks later.²³ In a speech in September, Gorbachev singled out for unusual criticism Afanasyev, since 1983 the Minister of Heavy and Transport Machine Building. A Supreme Soviet commission he said recently held heated discussions about the slow pace of management restructuring under Afanasyev. He noted, "The deputies gave it good and hot, figuratively speaking, to the leadership of this ministry—and they deserved it." Gorbachev then added that such cases "must evidently become a subject of discussion in the party Central Committee."²⁴

The General Secretary also has intensified criticism of defense industry leaders who are slow to restructure their attitude and approach to consumer goods production in line with the party's modernization goals. In June, the CPSU Central Committee reprimanded four defense industrial ministers²⁵ for allowing the manufacture of poor quality T.V. sets, radios, and tape recorders and fired a television factory manager for inferior products. Gorbachev had criticized the factory by name during his tour of the Volga River region in March 1986. In September, he emphasized that modernization requires a fundamental change in the popular attitude that deprecates machinery production for light industry and agriculture, that the defense industries are expected to fully support the retooling of these sectors, and that he is not buying the argument of some who say it is easier to go into space than to build automated spinning looms:

You know that everyone has got used to being able to sell off any old machine to agriculture, just junk, and the attitude is the same for the food industry, and even for light industry. Thus we have decided to instruct the defense ministries to help light industry, the food industry and the rural sector to resolve certain issues, to get rid of bottlenecks. They tell us, listen, it is easier to deal with defense matters and go into space than to improve the technical level of looms, or to make machinery for the food industry.

It seems you need enormous qualifications and real design talent, you see, to deal with these tasks. Thus we need to change the attitude to these sectors in the country. We have all been brought up to respect defense and heavy industry. And this is right, and this education was of great importance. We now have a reliable base for the country—power engineering, heavy industry, defense, and so on. However, now

²³ According to Ryzhkov, Balmont was dragging his feet in reorganizing his ministry's scientific research and development units and evidently failed (or refused) to close down one large unproductive Moscow institute—a decision that the Council of Ministers was ultimately forced to take. (See *Pravda*, June 19, 1986).

²⁴ See his speech in *Pravda*, September 20, 1986. In July 1987 Afanasyev was also retired.

²⁵ From the radio, communications equipment, electronics, and general machine building. See *Pravda*, June 3, 1986.

we also need to say that the time has come to concern ourselves with mechanizing the agrarian sector, light and food industry.²⁶

Gorbachev spoke these words in a talk with a collective farm worker in Krasnodar, and they were recorded and broadcast over national radio.

This recent criticism sends clear signals to the military-industrial complex that Gorbachev is serious about defense support for modernizing the civilian economy. It also reveals that the response from the defense industries to produce highly efficient civil machinery and better consumer goods falls short of party expectations. However, for the most part—and for the present at least—the Soviet military establishment is probably pleased with the main thrust of Gorbachev's economic strategy, especially its emphasis on strengthening the machine tool base and manufacturing technologies that address the future needs of weapons production and industrial preparedness. Gorbachev's plans for refurbishing the country's industrial base will certainly involve increased competition with the defense sector for many of the resources used in the production of weapons. The competition for scarce materials might cause the pace of production of some new systems to be somewhat slower and the date of introduction to be somewhat later than the Soviet military would prefer. But even allowing for such delays, Gorbachev's declared modernization goals are unlikely to significantly impede the completion of the major deployment of strategic weapons that the Soviets have programmed through the 1980's. In the long term, moreover, the Soviet military establishment would appreciate that a strong, high-technology civilian sector could support an even stronger defense effort.

IV. STRATEGY DIRECTIONS

The multiple paths that the Soviets are pursuing to accelerate S&T advance span a broad set of policy areas and specific measures. Recent efforts to implement most of them are a continuation or intensification of earlier policy, which has often only partially and haltingly been carried out. For the most part, they seem to have been largely "posturing" and "prepositioning" steps, which have had only limited results to date. Gorbachev has taken these "bits and pieces" of S&T strategy and fashioned them into an integrated whole, while giving new impetus and emphasis to implementation. However, there are still important "holes" in the whole, with some problem areas not yet addressed and formidable obstacles still blocking the way in areas where the regime has taken only some first steps. Basically, evolving S&T strategy includes the following directions:

²⁶ Moscow Domestic Service, 1500 GMT, September 19, 1986. The reference to "looms" may relate to sentiments that Party Secretary Zaykov heard during his April visit to Tula Oblast. The Soviet press, reporting on his trip, noted, "The main ways of accelerating S&T progress, automating plants, and equipping them with electronics were discussed at the Tula Firearms Plant and the Precision Machine Building Plant. Great attention was devoted to increasing aid to group 'B' industry machine building enterprises. The need to increase output of jacquard looms and new-generation automated hosiery machines was particularly noted. The use of this equipment will make it possible to increase output of high-quality goods and to saturate the domestic market with them." (*Izvestiya*, May 1, 1986, emphasis added.)

(1) Improving long-range planning of science, technology, and the economy with greater emphasis on the use of R&D results in production and in modernization of both civilian and defense industries.

(2) Fashioning major development programs for priority S&T problems and integrating them into economic plans. Key dual use technologies are being targeted for accelerated advance and increased emphasis is put on technology transfer and interaction between the military and civilian sectors.

(3) Reorganizing the State Planning Committee (Gosplan), the State Committee for Science and Technology (GKNT), and the Academy of Sciences and strengthening their roles in S&T policy planning and coordination.

(4) Restructuring the network of R&D institutions to improve the experimental base of science, and coupling of research with production, and the interaction between civilian and defense sectors in key areas of applied S&T. Special emphasis is being given to the creation of national-level interministerial scientific-technical complexes (MNTKs) to speed the development and application of key technologies.

(5) Strengthening both the incentives for innovation and the penalties for failure to innovate among scientists, engineers, and managers.

(6) Raising technical standards and improving quality control through the organization of independent inspectors subordinate to the USSR State Committee on Standards, modeled along the lines of defense industrial practices.

(7) Reforming the Soviet educational system from top to bottom to prepare a more technologically literate population able to cope with the increasing demands of the computer age.

(8) Expanding the party's involvement in directing S&T efforts, accelerating innovation and modernizing the economy, and monitoring priority S&T programs.

(9) Revising personnel policy to promote to key government and party positions people who have technical expertise and managerial experience with a strong track record of innovation—frequently in the defense industries.

(10) Reorienting investment policy to support faster and broader retooling of the economy and the development of science and applications of its results.

(11) Strengthening S&T cooperation within CEMA on the basis of more integrated long-range planning (to the Year 2000) of S&T progress within the Soviet Bloc and greater use of "direct links" between developers and users of new technology.

V. PROBLEMS AND PROSPECTS

A. STRATEGY OUTLOOK

Mikhail Gorbachev has moved S&T strategy from the design phase into action. So far, however, the regime has taken only the first steps toward implementing its ambitious modernizing program to prepare the USSR for the 21st century. We can expect more vigorous implementation of most of these measures in the current 1986-90 plan period, and it will stretch into the mid-1990's. Wheth-

er the leadership can sustain the investment and muster the political clout that are really needed to ensure implementation is uncertain, however.

If the party's S&T strategy is to succeed, strong leadership from the top, increased party involvement and support, better use of both administrative measures and monetary incentives, and, above all, substantial allocations in resources and investment will be required. Real progress will hinge particularly on several key issues:

- Gorbachev's success in securing his position—and his willingness to use his power to overcome entrenched institutional opposition to new ways of economic management and new priorities.
- Implementation of changes in planning, organization, management, and incentives that would give innovation in the civilian sector the high priority that it already enjoys in the defense industries. Without reform of the basic workings of the civilian production sector, ongoing leadership efforts to reorganize S&T policy organizations and R&D institutions will be insufficient to meet the new S&T modernization goals.
- Reorienting resource allocation policy to sustain investment to follow through on the party's ambitious plans for modernizing and retooling the economy, building on the substantial flow of resources targeted in the 1986-90 plan.
- Deepening and broadening the process of personnel turnover—already well under way, and strengthening personnel assignments based on technocratic expertise, rather than political credentials. The promotion of more competent managers and technocrats to leadership positions at all levels is essential to ensure implementation of current S&T policy initiatives. Gorbachev will probably look in particular to party organizations in 22 cities where 80 percent of S&T is concentrated as areas in which to make new appointments as well as from which to recruit personnel for Moscow.
- Refashioning of the party apparatus—its organizational structure, personnel expertise, and attitudes—making it a force for technological change, rather than an obstacle. Implementation of such institutional change could be pushed through only by a strong General Secretary who is firmly committed both to faster technological progress and to an expanded role for the party in modernizing the economy.

Gorbachev's initial moves over the past two years suggest that some of these "necessary" conditions for implementing this ambitious S&T course probably will be met. He has moved rapidly to consolidate his position and has shown that personnel policy remains a top priority item. In his speeches and forays into the provinces—especially since the party congress—his strong verbal commitment to S&T modernization and almost hyper emphasis on more rapid, bolder restructuring have sent strong signals throughout the political system that he intends to move forcefully in this area—keeping the pressure on—and that opposition would not be wise. Yet, there are also clear indications that "restructuring" for S&T progress is meeting heavy resistance and resentment within the Soviet bureaucracy and parts of the broader population as well.

Even with Gorbachev's and the Politburo's complete support, and assuming that initial bureaucratic and institutional barriers can be overcome, the ultimate success of this approach to modernization is not assured. Its key aspects reflect the political and ideological biases in the existing economic system, and its momentum stems partly from the establishment's desire to avoid the fundamental systemic changes that may be required for S&T policy to succeed. For the most part, these policy measures are neither new nor radical. They essentially maintain both the existing party power structure and the overall centralization of the Soviet system.

Ironically, however, the objectives of this S&T modernization effort and its mounting momentum may increase pressure for further changes in direction that the leadership would probably want to avoid. Ongoing measures may actually strengthen pressures for more radical economic reform, such as a freeing of prices and basing incentives on profits, that have been considered anathema by the party's moguls. Indeed to be effective, evolving S&T initiatives seem to demand more extensive changes in the structure and staff of the party apparatus, in general party membership and recruitment policy, in the distribution of influence and power within the party, and in the party's external relations with other parts of the power structure. S&T strategy also requires movement toward reducing plan directives for production units, better innovation incentives across the board, and changes in the organization and operation of the economic ministries—steps the leadership has so far been unwilling or unable to make.

It is too early to know whether Gorbachev, during his probably long tenure in office, will address these even more controversial issues. His speeches, nonetheless, indicate that he puts a high priority on faster S&T modernization and accelerated economic growth and that he intends to push hard in this area—factors that may lead him to adopt bolder measures if he becomes convinced that a less radical approach will not get the job done. He has also recently emphasized that “nobody—even in the Politburo” has ready-made solutions for putting into effect the strategy of acceleration. “We must learn as we go along, and not be afraid to advance boldly and to take risks.” In short, he declares, “We will carry out the restructuring on the march, so to speak.” These recent statements hint at the need for more improvisation in carrying out the modernization program.

The obstacles blocking rapid or easy advance are formidable. Not only must the latest science and technology be mastered, but also long-lived cultural conditioning, attitudes, and relationships must be changed. Dealing with the “human factor”—the mentality, psychology and patterns of behavior—will be at least as difficult, if not more, as developing and applying new technology. Even more important, the rigidities inherent in the present economic system will provide formidable barriers to any initiatives to accelerate progress in either diffusion of new technology or in encouraging innovation. Nonetheless, if the commitment can be sustained and the will acquired to implement this long-range S&T strategy, the incremental progress of the past in furthering economic growth and military prowess will probably be sustained.

B. THE MILITARY MODEL

It is also unlikely that the Politburo's attempt to engineer a high-technology revolution "from above" and industrial revitalization by decree will achieve its objectives. In the past, the leadership's direct intervention has been an important spur to technological innovation and development, especially in the defense sector. But today's economy is much more complex, and the leadership's political capacity to intervene directly to solve problems is necessarily limited.

More specifically, priorities by definition must be limited. Increasing the number of civilian priority programs, for example, might undermine the effectiveness of the USSR's military programs by diverting resources and personnel. The planning and management approaches of the defense section, moreover, cannot be transplanted easily to the civilian side, and they will not work there with equal success. The institutional environments are different, and formal application of military R&D techniques is not likely to be sufficient. To assure that decisions prevail and programs are implemented, civilian managers must institutionalize defense industry methods in their attitudes and working relationships. Some of these measures to accelerate progress in S&T constitute a challenge to long-established attitudes and institutional interests, will tax the capabilities of key elite groups, have already sparked resistance and political controversy, and could lead to a revision, slowing or reversal of the present course.

Rather than copy the capitalist or socialist market economy as their model to speed technological advance, the Soviets have apparently decided to use their own military economy. Their approach to S&T is to build priority programs along with special management/monitoring mechanisms to protect and implement them much as has been done in the defense sector. It seems likely that the Soviets will be frustrated in this effort, and they will be unable to successfully transfer the higher quality performance of the military to civilian production. The major obstacle is that the priority status now accorded the military sector—whether it be the lavish use of materials, the assignment of competent and experienced managers, or the attentive supervision of high-level government and party officials—cannot realistically be extended to the whole economy.

The leadership is trying to enlarge the list of national priorities, traditionally made up of mainly major defense programs, to accommodate major civilian programs, i.e. Food, Energy, and Consumer Goods. These are designed to solve key economic and social problems through better use of science and technology—that have been deliberately neglected in the past by the leadership, due largely to the cost of the large defense burden. Not everything, however, can be made a priority. To command the necessary resources and high-level attention, the number of programs must be strictly limited; otherwise, uncontrolled proliferation of programs, each with high supply priority and explicit backing from political leaders, would seriously distort over the long run the whole structure of the economy. More important, greater priority for civilian programs—even those which may have some long-range benefits to weapon systems development—increases the competition for scarce resources, po-

tentially squeezing military industry programs and defense modernization needs, as well as threatening low-priority civilian programs.

Beyond the issue of resource allocation, promoting the defense industry model is also not likely to bring to the economy large gains in productivity, efficiency, or innovation—key goals of the modernization program. Although military output has been high in numbers of new weapon systems, improved effectiveness, and increased capabilities, on balance, productivity in both civilian and military R&D has been notably poor. The defense sector's reputation for quality and efficiency has sometimes been achieved at a substantial resource cost, according to some Soviet emigres.

The defense industry sector, moreover, has not been that successful at technological innovation. Defense scientists and engineers have shown themselves to be innovative in using available technology to design effective weapons, but not as innovative as their Western counterparts in making technological breakthroughs. While the military R&D system is well adapted for managing high-priority weapon programs, it is not well adapted for encouraging and exploiting small-scale, incremental technological advances that collectively and cumulatively can have a major impact on low-priority weapon programs. In addition, Soviet defense industry continues to have serious deficiencies in such key areas of military technology as the design, manufacture, and quality control of microelectronics and computer technology.

Despite these limitations, the defense industries are better manned than the civilian industries, and the transfer of some officials to the civilian economy probably will have a public impact. Yet, it is also evident that the geniuses that have been reassigned to the civilian sector have not been supermen or miracle workers in restructuring and turning around their organizations. At the same time, this transfer will probably not have a significant adverse impact on military R&D programs or defense industry activities. Indeed, the reassignment of these experienced executives suggests that the Soviet leadership is confident that suitable replacements can be found from among their subordinates without any detriment to the military-industrial complex, and that its managerial wealth can be used to shore up lagging sectors of the economy.

Greater defense industry and civilian economy interaction, moreover, could help weapon system development. To be sure, current efforts to accelerate introduction of the latest manufacturing technologies, materials, and processes in civilian ministries involved in defense production could have a disrupting effect on production operations in the near term. At the same time, increased attention to civilian machinery and consumer goods production at defense facilities is also likely to have a disrupting effect and to tax the capabilities of defense industrial managers. These short-term disruptions, however, are probably viewed by the leadership as more than offset by the hoped-for, long-term improvements in capabilities to design, fabricate, and manufacture more sophisticated weapon systems in the 1990's and even possibly in the second half of the 1980's that will result from increased priority for civilian S&T modernization programs.

THE SOVIET INFORMATION REVOLUTION: SOME PROSPECTS AND COMPARISONS*

By Richard W. Judy**

CONTENTS

	Page
Summary	161
I. Introduction: Informatics <i>a la Russe</i>	162
II. Comparing Apples and Oranges	162
A. American Innovation vs. Soviet Imitation	163
B. American Revolution vs. Soviet Evolution	163
C. The Volume of US Production Is Vastly Greater	164
D. Soviet Computer Applications Are Focussed on Production	164
III. The Coming Soviet Information Revolution	165
IV. Some Broader Implications	171
V. Selected Bibliography	173

SUMMARY

The "information society" is developing very differently in the Soviet Union than in the United States. The goals and institutional environments within which the technologies are being developed and applied are highly disparate. The Americans are innovators and "standard setters" in the technologies whereas the Soviets are adopters and adapters. New technologies burst upon the American scene in a revolutionary manner while they evolve gradually in the Soviet Union. Perhaps most significant of all is the vast difference in the number of computers and their applications in the United States compared with the Soviet Union.

Computer and communications technologies are applied ubiquitously across a broad spectrum of economic and social activities in the United States. They are applied very selectively in the Soviet Union to targets accorded high priority by the political leadership. The prime targets are military hardware, top level decision support systems, research and development, computer aided design (CAD), and a variety of applications in the material production sphere. Other targets such as management information systems, professional usage of personal computers, and education are accorded significant importance but not top priority.

Western observers have wondered and conjectured about the probable implications of the "information revolution" for Soviet society. Theories range from the notion that widespread computer

*The material for this paper is from a study sponsored, in part, by the National Council for Soviet and East European Research.

**Senior Research Fellow, Hudson Institute.

usage in the USSR will prove inimical to the maintenance of Soviet power to the opposite proposition that computers will serve to strengthen the control of the people by the police. Neither of these theories seems particularly plausible for the near future.

A more significant kind of implication surrounds the conflict between the dynamic, responsive, and adaptive attributes of socio-economic institutions that are needed to exploit the opportunities offered by the new technologies and the sluggish, inertial nature of the Soviet system. The new Soviet leadership appreciates the necessity to change the performance of their system but the institutional mutations that could successfully induce such change may profoundly change the system itself.

I. INTRODUCTION: INFORMATICS A LA RUSSE

The term "informatics" is used throughout this paper to denote the totality of computer and data communications sciences, technologies, industries, and applications.¹ The "information revolution" in any given society is taken here to mean the dynamic interaction that occurs over time among the computer and communications technologies and the various institutional processes and actors in that society. A snapshot of the results of that dynamic interaction taken at any point in time may be regarded as the "information society" existing at that point.

This paper examines the nature of the Soviet information revolution as it appeared in the mid-1980s. That examination is cast against a backdrop on which certain salient features of the information revolution unfolding in the USSR are contrasted with the American experience.

II. COMPARING APPLES AND ORANGES

An important meta-conclusion that emerges from a study of informatics in the Soviet Union and the United States is that the two countries are not in the same league. Upon closer inspection, it becomes apparent that they are not even playing the same game.

The objectives of the information revolution differ dramatically in the two countries. In the American case, thousands of firms offer a bewildering variety of hardware, software, service, and telecommunications options. Those firms attempt to shape market demand but ultimately they must respond to market forces in a highly competitive environment. Public policy influences those forces, usually at the margin, but overarching social objectives are hard to discern and, for practical purposes, do not exist.

In the USSR, the development and application of computer and communications technologies occur within a system where the top political and economic leadership attempts, with uneven success, to focus and direct those technologies according to a set of politically determined objectives. No such central articulation of objectives exists in the United States, and the technology is applied ubiquitously across the economy and society.

¹ The Russian word *informatika*, stemming from the French *informatique*, covers the same broad domain.

A second core distinction pertains to the institutional environment. The American version of the information revolution is a "bottom up" phenomenon while the Soviet version proceeds from the "top down." In the U.S., the primary actors are thousands of firms and individuals who seek to produce and sell or to use information products and services. They interact in a market process that is decentralized and fast paced. That market contrasts sharply with a Soviet process in which the main decisions are the outcomes of ponderous maneuvering among political and bureaucratic actors.

So long as goals and institutional environments remain so disparate, it follows that the "information society" is destined to unfold very differently in the USSR than in the United States. Comparisons of the two countries' informatics performances are likely to go askew to the extent that they are based implicitly upon the assumption that the two are "playing the same game." The hazards here of "mirror imaging" are considerable. To restate it: the Soviet and American "information societies" are and will remain very different. Among the differences are the following:

A. AMERICAN INNOVATION VS. SOVIET IMITATION

The Americans are innovators and standards setters in informatics. The Soviets are adopters and adapters across the entire spectrum of this technology and its applications.

Contemporary Soviet mainframes virtually are confined to the IBM 360/370 architecture and marginal modifications thereof. Soviet minicomputers are variations on themes originally scored by Digital Equipment Corporation (DEC) or Hewlett Packard. Soviet personal computer designs stay close to the "international standards" of DEC's PDP-11, the IBM PC or the Apple II. At the component level, Soviet semiconductor designs borrow heavily from Intel, Texas Instruments, and Motorola.

B. AMERICAN REVOLUTION VS. SOVIET EVOLUTION

Computer designs, once transplanted onto Soviet soil, mutate and persist much longer than in their native habitat. The pattern is for the Soviets to employ a few basic computer and IC designs, indeed, many fewer than in the United States. These few designs, however, are exploited very widely in many different applications. The Soviet tendency is to make many modest improvements at the margin of a design over a longish period of time. During that same period in the United States, as many as three generations of successors to the original design typically might come and go with each descendent displaying substantial improvement over its predecessor.

In its conservative policy of technological incrementalism, the Soviet Union pursues a strategy of "making more of less," a strategy similar to that followed in military hardware, space systems, high energy physics, and other fields.²

² See *The New York Times*, August 16, 1986.

C. THE VOLUME OF U.S. PRODUCTION IS VASTLY GREATER

The Soviet computer industry has made impressive strides in the past twenty years. From a mere 70 million rubles in 1966, the value of its output grew to 4.2 billion in 1985.³ In the late 1960s and early 1970s, the annual rate of output growth was in the 30 percent to 40 percent range. After a sharp decline in the late 1970s, the growth rate has trended upward from 11 percent to 14 percent since 1980.

So Soviet informatics growth is pretty impressive . . . until it is compared with developments in the United States. Contrast, for example, the 4.2 billion rubles of Soviet computer output in 1985 with the \$40.5 billion American production in 1983, the last year for which U.S. data are available.⁴ American computer production is currently on the order of ten times greater than the Soviet.

During the period 1965-1983, the U.S. computer industry shipped \$358 billion worth of product while the USSR produced about 22 billion rubles worth, i.e., the United States produced about 16 times more.⁵ With every passing year, the absolute magnitude of this quantitative gap yawns wider because roughly similar rates of growth are operating on very dissimilar bases. At the present rates of growth in the two countries, the Soviets' annual output would overtake the American level sometime after 2050. Even if the Soviets were able to double their growth rate to 28 percent per annum vs. 10 percent for the U.S., they would enter the next century in the rear.

What goes for hardware goes double for product quality and quadruply for software and service. U.S. software sales in 1986 were on the order of \$16 billion. No comparable estimate for Soviet software production exists, although it was certainly much less. The Soviet software industry rivals the Soviet telecommunications system for the dubious title of "greatest laggard" in the entire informatics complex.

The vastly greater production and use of computers in the United States puts this country into a qualitatively different category than the USSR. Computers and communications technology are ubiquitous here; not so there.

D. SOVIET COMPUTER APPLICATIONS ARE FOCUSED ON PRODUCTION

Soviet informatics policy has aimed the technology at several specific application areas. The technologies have been cast by the nation's political leaders in a role supporting production, particularly manufacturing production. To a major degree, Soviet computers produce direct inputs into goods production processes. This is in contrast to the American pattern, which has become one of comprehensive application across a very wide spectrum. In the United

³ All ruble figures have been adjusted to 1982 prices. The original Soviet data are from *Narodnoe khoziaistvo v 1985 g.*, Moscow, 1986, p. 131, and from preceding issues of this annual statistical handbook.

⁴ U.S. data are from *Statistical Abstract of the United States, 1986*, Washington, GPO, pp. 765-768, and from earlier years of this publication.

⁵ This assumes a ruble/dollar ratio of unity which, according to a rough comparison of dollar and ruble prices for roughly comparable computer equipment, greatly flatters the ruble. The vast American quantitative superiority is understated to the degree that the value of the ruble is overstated.

States, the technologies have found widespread application not only in production but also in the delivery of information-based services (financial services, insurance, etc.), in retail trade, and as outputs for consumer usage.

As we shall presently see, maintenance of a careful aim is implicit in the most recent Soviet plan to deploy informatics technology during the remaining years of this century. That aim, if maintained, will continue to set the Soviet "information society" quite apart from the American model.

III. THE COMING SOVIET INFORMATION REVOLUTION

On January 4, 1984, *Pravda* announced that the Politburo had "considered and basically approved a state-wide program to establish and develop the production and effective utilization of computer technology and automated systems up to the year 2000." Raising economic productivity and efficiency by accelerating scientific and technical progress, particularly in machine building and electronics, is the global objective of this new program.

Mikhail Gorbachev, in his report to the June, 1985 conference of the Central Committee, put the matter in the following words:

Machine building plays the dominant, key role in carrying out the scientific and technological revolution. . . . Microelectronics, computer technology, instrument making and the entire informatics industry are the catalyst of progress. They require accelerated development.⁶

The new informatics program, which has not been disseminated abroad, calls for increased production, improved quality, and the introduction of new models of computer equipment. Applications of informatics technology, especially computers and microprocessors, and automation are to lead to a "comprehensive intensification of the national economy." The program specifies scientific research, machine building, metallurgy, power engineering, and natural resource exploration as the areas of highest priority for the application of the technology.

From the situation as we know it in the mid-1980s, the new party informatics program can help us to glimpse the outlines of the Soviet information society as it is intended to unfold during the remainder of this century. The official intention clearly is to concentrate Soviet resources on the following favored sectors:

1. Military applications have top or near-top priority. Odum, Peterson, and other watchers of the Soviet military agree that major changes are underway in Soviet defence doctrine.⁷ Weapons systems employing sophisticated microprocessors as well as other computer and communications technologies are among the chief ingredients of that revolution. Soviet political leaders and civilian spokesmen in the computer field have made no secret of the critical importance that they attach to the military application of high-tech information systems. The pride of place given to military applications historically has been the one great commonality of the

⁶ *Pravda*, June 12, 1985, p. 2.

⁷ See Odum, W.E., "Soviet Force Posture: Dilemmas and Directions," *Problems of Communism*, pp. 1-14, July/August, 1985, and Peterson, P.A., "The Modernization of the Soviet Armed Forces," *Nato's Sixteen Nations*, pp. 32-38, July, 1986.

American and Soviet computer worlds although it may be less true now in the United States.

2. Top Level Decision Support Systems (DSS) are computerized systems designed to meet the information needs of the central agencies of the Soviet state and the Party. Examples are the systems operating in Gosplan, Gosbank, Gosnab, TsSU, and some ministries. Most of these are multi-level systems with at least two levels, central and republican. Initial versions of most appeared early in the 1970s or even the 1960s. By the mid-1980s, several are in the second or third generations of their implementations.

These DSS are a mixed bag in terms of sophistication and success. Western generalizations tend to be poorly grounded given the sketchy nature of knowledge about them.⁸ Except, possibly, for the Gosbank system, these DSS have no counterparts in the United States "information society."

3. Research and Development applications of information technologies, particularly within the USSR Academy of Sciences, were a top priority until the late 1960s. After 1965, control of the fate of Soviet computerdom was wrested from the Academy and vested in several industrial ministries. Evidence of a restored high priority to research computing was provided in 1983 when a new Section of Informatics, Computer Technology, and Automation was established in the Academy of Sciences with Evgenii P. Velikhov at its head. Further evidence was supplied in late 1986 when G. I. Marchuk, a Novosibirsk computer scientist, was named President of the Academy of Sciences.

4. Computer aided design (CAD) became an application of high priority in the 11th Five Year Plan (1981-1985).

Soviet CAD technology lags seriously behind the American but it nevertheless has reached the stage of being very valuable for electronics and mechanical design work. Various problems attend the introduction of CAD in Soviet design organizations although difficulties are present also in this country. The Soviet problems arguably are worse because a perversity of their incentive system gives designers greater rewards when they create more expensive designs. High barriers between Soviet design bureaus and production organization also impede the fullest implementation of CAD.

5. Automatic data processing (ADP) and Management information systems (MIS) were applications of prime official interest in the early 1970s but have lost much of their earlier luster. ADP and MIS initially were oversold in the Soviet Union, just as they were in this country. Expectations soared high above actual performance. Disillusion was inevitable and, by the late 1970s, reaction had set in. Since 1975, the growth of these applications has trailed far behind others more sharply focused on the management and control of material production processes.

Some of the shortcomings and negative manifestations of Soviet ADP and MIS are due to uniquely Soviet circumstances. Among the most important of these factors has been the lack of any particular incentives for managers to implement and use these com-

⁸ The last comprehensive look at these systems was by Martin Cave in his *Computers and Economic Planning: The Soviet Experience*, Cambridge University Press, Cambridge, 1980.

puter-based systems.⁹ A substantial number of the problems and shortcomings of Soviet ADP and MIS were or are familiar in this country. Furthermore, much of the difficulty must be attributed to the fact that the Soviets were starting in the 1970s at a point passed by the Americans in the 1950s. The learning curve everywhere starts at point where knowhow is low, ignorance is high, and Murphy's law operates with a vengeance. Learning by doing is the only way to learn in this field, but it is painful and expensive.

The 1980s have, so far, been a period of consolidation on the Soviet ADP-MIS front. They are trying to learn from their failures and replicate their successes, but the path is anything but smooth and easy. Human and institutional obstructions combine with technological potholes to make it a rough road to progress. The Soviets still suffer a shortage of experienced systems designers. Management and information systems professionals frequently do not communicate adequately at the systems design stage. Soviet communications poorly support teleprocessing and distributed data processing systems. No satisfactory mechanism has yet been devised to produce and propagate good software. The supply of maintenance services and spare parts remains inadequate.

The Soviets will continue to have their share of problems, and probably more, as they proceed to introduce computer-based information systems into their economic and administrative institutions. But they will have successes as well as disasters. Gorbachev's managerial "restructuring" may make Soviet managers more receptive to the potential contributions of ADP-MIS, but that remains uncertain at this juncture.

6. Industrial applications of informatics long have been among the top Soviet priorities.¹⁰ The pace of implementing automated process control systems surpassed that of management information systems in 10th Five Year Plan (FYP).¹¹ The new emphasis being given to microprocessors, computerized numerical controlled machine tools (CNC), robotics, and other "smart" machinery represents a stepping up of the already high priority accorded industrial applications. The marriage of these various technologies makes possible flexible manufacturing systems (FMS), computer integrated manufacturing (CIM), and other kinds of computer aided manufacturing (CAM).

It can be argued with merit that Soviet robots and machine tools are less sophisticated than their American counterparts, but so are Japanese robots. That "gap" hardly has stopped the Japanese from making good use of this technology. It seems probable that the leading edge of American manufacturing technology is still out in front. But the points stressed here are two: (1) The Soviets are making a determined effort to close the qualitative gap. (2) If

⁹ Soviet difficulties with ADP and MIS are covered in William K. McHenry's contribution to this volume as well as in his other works, viz., McHenry, W. K., *The Absorption of Computerized Management Information Systems in Soviet Enterprises*. Unpublished doctoral dissertation, University of Arizona, Tucson, 1985, and McHenry, W. and Goodman, S. E., "MIS in Soviet Industrial Enterprises: The Limits of Reform From Above," *Communications of the ACM*, 11:1034-1043, 1986.

¹⁰ The word "industrial" is used generically to include manufacturing, extraction, construction, and transportation although industries like machine building, energy, and electronics are clearly in the top spot. The definition excludes trade and services.

¹¹ "ASUTP" is the Soviet acronym for "automated process control system."

Soviet statistics are to be believed, new computer aided manufacturing technology is being installed at a faster clip in the Soviet Union than in the United States. Gorbachev & Co. are betting that, sooner or later, these efforts will pay off.

When thinking about massive introduction of new, computer-based design and manufacturing technologies, it is well to remember what traumatic problems will attend that process. The change from conventional manufacturing to CAM has serious implications for the work force. Many workers and skills are rendered redundant. Those workers remaining on the production floor must perform a wider range of duties and they normally require substantial retraining. The nature of work changes qualitatively. Workers' attributes of attentiveness, diagnostic acuity, initiative, sense of responsibility, and concern for quality assume preeminence. Narrow job classifications, which may have been suitable for traditional manufacturing, become irrelevant or a hindrance to the adjustments required for CAM.

FMS and CAM, if they are to be successful, necessitate an entirely new and integrated approach to product and manufacturing process design. If a product is to be manufacturable by robots and movable by computer-controlled materials handling equipment, its assemblies, its components, and the product itself must conform to constraints imposed by the specifications of the robots and equipment. Product designers must bring manufacturing considerations into their work at the earliest stage. Standardization of components and subassemblies for different final products becomes very important.

Piecemeal introduction of the more sophisticated types of CAM, such as flexible manufacturing and computer integrated manufacturing, is hardly feasible. In an existing organization, the older manufacturing line usually must be shut down, the area gutted of old equipment, and the new equipment installed. Obviously, much careful planning must precede this step or the new system will work poorly if at all. The various components and other prices of equipment must arrive in a timely fashion so that they may be installed by skilled workmen. Missing links in an automated line typically mean that the line cannot operate or must do so with "inserts" of manual labor at the missing links. This is usually an expensive expedient and often quite unsatisfactory.

Full realization of the potential benefits of CIM requires that the control of inventories at both ends of the manufacturing processes be integrated into the system. At the input end, the computerized system should maintain stock records of all purchased and manufactured components and subassemblies. From these and from usage data captured while the computers monitor the production processes, the system should trigger orders to suppliers, preferably on a computer-to-computer basis via telecommunications linkage. At the output end, the CIM system should interface its inventory of finished products with sales and shipping information, again, on a computer-to-computer basis.

The integration, under computer control, of a broad range of functions from material input to manufacturing to product distribution creates the conditions for highly integrated data collection, storage, and processing. The experience of American firms is that a

preponderance of the payoff from CIM comes at this stage where the CIM system interfaces the management information system. Great savings of personnel costs and improvement of function become possible at middle management levels as the system takes over responsibility in functions like ordering, receiving, inventory, shipping, accounting, etc.

The preceding few paragraphs constitute a digression on some aspects of implementing sophisticated, informatics-based design and manufacturing systems. The purpose of the digression is to underscore two important points:

First, many of these difficulties are generic and pose serious challenges irrespective of the socio-economic systems in which they may be implemented. On the other hand, specific national circumstances and traits of socio-economic systems may ameliorate or exacerbate those difficulties. During the mid-1980s in the United States, for example, these generic difficulties combine with substantial excess manufacturing capacity, sluggish investment in new capital equipment, and a growing propensity of management to concentrate on short run financial performance to depress the rate of implementing CAM. The USSR, as we shall presently see, has its circumstances and traits that also exacerbate the problem.

Second, enterprise management will consider the costs of implementing FMS and CIM prohibitive in direct proportion to its concern with short term versus long term performance, the more it faces conditions of a sellers' market, and the more it faces inflexible labor conditions and unresponsive suppliers. Since these features characterize the traditional form of Soviet industrial organization, it is reasonable to expect that the Soviets will encounter very serious difficulties so long as they retain that form. If the incentive structure that Soviet enterprise managers confront continues to reward fulfillment of a plan based on historical performance levels, those managers are likely to see few benefits to balance the risk and expense associated with the introduction of new manufacturing technologies.

A serious contradiction exists between Gorbachev's push, on the one hand, to implement computer-based manufacturing technology and, on the other, his insistence that the thrust of investment should be in existing plants rather than new ones. However, great may be their eventual payoffs, the implementation of FMS and CIM in the Soviet Union or anywhere else is extremely disruptive in the short run. We speak here of dismantling production lines, gutting shops or factories, lengthy retraining of many workers, and the redundancy of many former employees. These are wrenching changes in an established organization. Is it surprising that managers contemplate FMS and CIM with trepidation?

The reverse side of this recitation of problems confronting the Soviets is the possibility that radical "restructuring" of their system of industrial organizational and management might radically improve the climate for implementing high-tech manufacturing capability. Giving managers much greater authority and responsibility for enterprise performance, keying their remuneration to a time discounted measure of that performance, and introducing competition should spur their receptivity to CAD and CAM. The success of Gorbachev's drive to "intensify" Soviet industry by

adding large catalytic doses of informatics thus hinges critically on his ability to implement fundamental reforms in Soviet industrial management. Grounds for great optimism on this point do not yet exist.

7. Personal computers (PCs) cum professional and educational work stations until recently have been low on the priority ladder. By American standards, the Soviet PC efforts have been very little and very late. The question is: Why? Western observers have relished the opportunity to speculate creatively while the Soviets dithered endlessly. Theories abound: Perhaps the Soviet leaders were afraid PCs would jeopardize Soviet power. Perhaps Soviet engineers were too inept to design a decent PC. Perhaps the questions of which PCs to produce (or import), who will produce them, and how many to produce looped with slow convergence inside the Soviet bureaucratic decision making apparatus. Perhaps the mass production of reliable, relatively sophisticated, electronic gear poses tough manufacturing, distribution, and support challenges to Soviet industry. The last two of these theories would seem most credible.

Whatever the reasons for Soviet PC flatfootedness, the act seems to be coming together very slowly. A spate of Soviet PC designs has emerged. One main thrust is to build IBM PC compatibles based on Soviet versions of the Intel 8080 and 8086 chips. Another is toward PCs using the venerable PDP-11 instruction set. Finally, the infamous "Agat," a Soviet version of the Apple II, seems still to be around after many attempts to squash it. The official target is for 1.1 million PCs to be produced in the 12th Five Year Plan. Nearly half of these apparently are slated for computer laboratories in the secondary schools.¹²

How Soviet PCs will be used is a question offering even richer possibilities for speculation than those of why it took so long to decide to build any and which PCs eventually will be built. Some say that PCs will be kept under lock and key like copiers. Others say the PCs will be out and available for use but the printers will be locked away. The decision may turn on a canonical interpretation: Is a PC more like a printing press or more like a typewriter?¹³ If the former, they must be locked up. If the latter, they may be disbursed freely.

The momentum of personal computers, even in the Soviet Union, seems to be so great that they can't be locked away. On the other hand, their scarcity will confine PCs mainly to official desks except for those that find their way into private ownership by way of *blat*, luck, and the second economy. PCs bode to become valuable productivity tools in Soviet workplaces as well as coveted status symbols.

8. Education long was stuck on the bottom rung of Soviet informatics priorities. Some upward movement has occurred in the past couple of years. The new crop of Soviet leaders appears to recognize that the right kind of human capital formation is no less necessary than computer hardware to the realization of their informa-

¹² The Soviet journal, *Mikroprotsessornye sredstva i sistemy*, which began publication in 1984, is an important source of information about Soviet personal computers. See, in particular, issue No. 4 of 1986.

¹³ Professor Loren Graham, recently returned from a long Soviet stay, suggested this to me.

tics dream. Considerable energy and talent recently have been infused into the world of Soviet educational computing. A multi-stage plan exists for getting computers into Soviet schools over the next fifteen years.

The first stage of the plan comprises a required informatics course for 9th and 10th grade students, a course that Judy and Lommel (1986) described in some detail. The learning objectives of this course differ sharply in some important respects from those of most computer literacy courses offered in American schools. The course's distinguishing feature is its heavy stress on algorithms, i.e., on formal techniques of building procedures for problem solving. Implementing the new course is an immense task. Teachers must be trained. Educational software, now virtually non-existent, is needed desperately. Above all, computers are required.¹⁴

The standard format for placing instructional computers in Soviet schools is in specialized classroom (*kabinet*) with 10-15 student computer workstations.¹⁵ Each workstation is a PC equipped with monitor, keyboard, processor, and small local memory. Essentially, it is a "smart terminal" of quite limited independent capability. The student stations are linked via a local area network to the instructor's station which, unlike the student stations, is equipped with disk drives and printer. The objective of keeping student workstations cheap coincides with that of restricting access. Reasonable observers may hold different opinions about which motive is dominant.

The plan calls for about 400 thousand PCs to be shipped to the schools during the 12th FYP. This is enough to equip about 30 thousand schools or one out of every two Soviet secondary schools. The number of computer-equipped classrooms is supposed to reach 100 thousand by 1995, and 120 thousand by the year 2000.¹⁶ All of this implies a plan to put about 1.3 million computers into Soviet schools by 1995 and about 1.6 million by the end of the century. These numbers compare with over 3 million computers in American schools in 1986.

Even if Soviet plans are fulfilled completely, something that depends upon their success in spurring PC production, Soviet educational computing obviously will be much less "hands on" and much more theoretical than educational computing in American schools.

IV. SOME BROADER IMPLICATIONS

The notion of an "information revolution" in the Soviet Union will strike many readers as a contradiction in terms. Numerous Western observers have written of Soviet computer ineptitude. Others believe they discern a deep ambivalence on the part of Soviet leaders before this technology. Some think information society is inconsistent with Soviet society. One might reasonably conclude from these writings that there can be no such thing as a Soviet information revolution.¹⁷

¹⁴ See the paper by Peter B. Nyren in this compendium.

¹⁵ Uvarov, A. Iu., *EVm na puti v shkolu*, *Informatika i obrazovanie*, 1, 1986, p. 14.

¹⁶ *Ibid.*, p. 15.

¹⁷ See, for example, "Moscow Faces the New Age," *Newsweek*, August 16, 1986, pp. 20-22, Alvin and Heidi Toffler, "Face to Face with Gorbachev," *Sunday Times Review*, January 4, 1987,

Continued

Could the computer open Pandora's Box in the USSR? Will widespread access to computers, including personal computers that may be networked together, threaten the state's monopoly of information flows? Or will the computer, at the other extreme, so enhance the state's mechanisms of control that the specter of George Orwell's *Nineteen Eighty-Four* becomes a high-tech reality?¹⁸

These intriguing questions must, alas, remain largely in the realm of conjecture, at least for now. Little empirical evidence is available to validate either the Pandora's Box theory or the Orwellian hypothesis. What we do know is this: The official policy is to proceed full speed ahead with a Soviet version of the information revolution. Far from displaying misgivings about the computer, the present Soviet leadership publicly portrays it as the "catalyst of progress."

As we have seen, however, the Soviet version of the information revolution differs fundamentally from that underway in the United States, Japan, and Western Europe. Soviet computer technology is intended to be mainly a provider of information and computational inputs into goods production processes. No challenge to political control is likely to ensue from process control systems, CAD, CAM, or even ADP-MIS applications. The potential challenge, if there were to be one, would have to come from personal computers and individual workstations, especially when linked together in local and wide area networks. Should the Kremlin be disturbed by this potential?

To an American, the words "information society" conjure up visions of PC-equipped citizens by the millions linked by telecommunications channels to each other and accessing large data bases in all parts of the nation. They retrieve every sort of information from CompuServe or The Source, shop and arrange airplane reservations, exchange electronic mail, post notices on electronic bulletin boards, conduct conferences, maintain scholarly communications, and indulge an enormous range of special interests.

A Soviet counterpart to our increasingly networked American society will not exist in this decade, and perhaps not in this century. Only a few hundred thousand PCs will sit on Soviet desks for at least a decade. The shortcomings of the Soviet telephone network will severely limit computer-to-computer communications at least until sometime in the 1990s. Finally, most users of Soviet PCs will be trusted professionals with little interest in undermining the system.

Although *Samizdat* may get a modest boost from the PCs, a flowering of Soviet desktop publishing is quite unlikely. Only a minority of Soviet PCs will be attached to printers, and most are likely to have only floppy disks for external storage.

Therefore, the marginal subversive impact of personal computers seems unlikely to be great when compared to that of somewhat

Walter R. Roberts and Harold E. Engle, "The Global Information Revolution and the Communist World," *The Washington Quarterly*, Spring, 1986, pp. 141-155. See also Wilson Dizard, "Mikhail Gorbachev's Computer Challenge," *The Washington Quarterly*, Spring, 1986, pp. 157-163 and Maxine Poilack and Alan Stapleton, "Why Ivan Can't Computer," *High Technology*, February, 1986, pp. 42-45.

¹⁸ Loren Graham posed these questions in his famous and lucid article "The Soviet Union Is Missing Out on the Computer Revolution," *Washington Post*, March 11, 1984, pp. C1-C2.

freer access to copiers, gradual improvement of telephonic voice service, and *glasnost* itself. The experience of Poland and Hungary, where the incidence of PCs is much greater than in the Soviet Union, suggests that the leaders have little to fear from popular access to these machines. The theory that PCs or other computers will become a significant subversive threat to the Party is probably a product of wishful thinking.

Turning to the other threat, that of Orwell's "Big Brother," there can be little doubt that the KGB and other "organs" have vast computerized dossiers on citizens of the USSR and other countries. On the other hand, the potential for computerized tracking and control of the population, and for the invasion of privacy, presently is and for the foreseeable future is likely to remain less in the Soviet Union than in the United States.

The reason for this apparent paradox is the obvious one that the average Soviet citizen moves about in a far less computerized society than does his or her American counterpart. Billions of computerized transactions in banking, payrolls, taxation, social security, credit, membership, subscription, investments, enrollment, trade, transportation, and a myriad of activities add vast quantities of information daily to records on millions of American citizens. Many of these records can or could be cross-linked by a common identifier, the social security number. Because official priorities have channeled the computer into the goods production sectors of Soviet society rather than into those with which the average Soviet citizen comes into daily contact, very many fewer data are generated about Ivan Ivanovich than about John Smith.

All of this hardly means that the information revolution *a la Russe* will have no broader impacts. Grinding collisions are already evident as the imperatives posed by new informatics technologies collide with the rigidities of Soviet institutions. The pace of technological change is rapid and accelerating. An ability to respond quickly and flexibly to new circumstances is indispensable to those individuals and groups that would take advantage of its possibilities. But such adaptive response means the ability to rapidly deploy and redeploy human and material capital as well as to restructure organizational forms and behaviors. The Soviet economy and society in its present, modified Stalinist form is a behemoth programmed to move predictably and ponderously in an ordained direction. But the informatics age demands agility and the ability to change direction quickly.

The Soviet leadership appears to recognize its dilemma: Either make the behemoth more agile or lose the game. But can a behemoth lose weight, become agile, and remain a behemoth?

V. SELECTED BIBLIOGRAPHY

- Adamov, E. and Dukarskii, S., Sistema kompleksnoi avtomatizatsii proektirovaniia, razrabotki i izgotovleniia izdelii v melkoseriinom mashinostroitel'nom proizvodstve, in *Problemy mashinostroeniia i avtomatizatsii*, 5, 1985, pp. 45-53.
- Babin, M. P., Avtomatizatsiia upravleniia na novom etape, *Pribory i sistemy upravleniia*, 1986, 2, pp. 5-6.
- Bomko, A. M., *EVM v sistemakh upravleniia proizvodstvom*, 1984, 127 Pp.
- Cave, M., *Computers and Economic Planning: The Soviet Experience*, Cambridge University Press, Cambridge, 1980.

- Davis, N. and Goodman, S., The Soviet Bloc's Unified System of Computers, *Computing Surveys* (ACM), 10:2, June, 1978, pp. 98-122.
- Egorov, V. A. et al., Avtomatizirovannaya sistema tekhnologicheskogo projektirovaniya tsekhov osnovnogo proizvodstva, in Orlovskii, G. B., (ed.) *EVM v projektirovanii i proizvodstve: Sb. statei*, vypusk 2, 1985, pp. 220-226.
- Frolov, K., Mashinostroyeniye i nauka v strategii uskoreniya, *Kommunist*, 6, (April), 1986, pp. 36-47.
- Glushkov, V. M., *Kibernetika, voprosy teorii i praktiki*, 1986, 477 Pp.
- Glushkov, V. M., Computing in the USSR, *Encyclopedia of computer science and technology*, New York, M. Dekker, 1979, Vol. 13, pp. 498-507.
- Golant, A. I., et al., ASU TP "Kupol-Sigma" na Gomel'skom khimicheskoy zavode im. 50-letiya SSSR, *Pribory i sistemy upravleniya*, 6, 1986 pp. 5-7.
- Goodman, S., Software in the Soviet Union: Progress and Problems, *Advances in Computers*, V. 18, 1979, pp. 231-287.
- Goodman, S., and McHenry, W., MIS in Soviet Industrial Enterprises, *Communications of the ACM*, 29(11), November, 1986, pp. 1034-1043.
- Goodman, S. and McHenry, W., Computing in the USSR, Recent Progress and Policies, *Soviet Economy*, Vol. 2, No. 4.
- Goriushkin, V. I., *Osnovy gibkogo proizvodstva detalei mashin i privorov*, 1984, 222 Pp.
- Hammer, C., et al., *Soviet Computer Science Research*, Technical Assessment Report FASAC-TAR-2020, Foreign Applied Sciences Assessment Center, Science Applications, Inc., McLean, VA, July 1, 1984.
- Iakubaitis, E. A., *Arkhitektura vychislitel'nykh setei*, 1980, 225 pp.
- Iakubaitis, E. A., Vishniakov, Iu. S., and Pirogov, V. V., O khode rabot po sozdaniyu Akademseti, in Alekseev, A. S. (ed.) *Perspektivy razvitiya avtomatizirovannykh sistem upravleniya projektirovaniya i informatsii*, 1986, pp. 19-25.
- Judy, R., Computing in the USSR; A Comment, *Soviet Economy*, Vol. 2, No. 4.
- Judy, R., and Lommel, J., The New Soviet Computer Literacy Campaign, *ECTJ: Educational Communications and Technology (AECT-ECTJ)*, 34(2), Summer, 1986, pp. 108-123.
- Judy, R., *The Rise of Computers of the Soviet Union and Eastern Europe, 1970-1985: A Survey and Comparative Analysis*, Hudson Institute, HI-3872, October, 1986, 231 Pp.
- Kassel, S., A New Force in the Soviet Computer Industry: The Reorganization of the USSR Academy of Sciences in the Computer Field, Santa Monica, Rand Corp., N-2456-APRA, August, 1986, 42 Pp.
- Kiesler, A., The hidden messages in computer networks, *Harvard Business Review*, 1986, January-February, pp. 46-60.
- Kolesov, V. I. et al., "Sozdaniye SAPR konstruktorskiy tekhnologicheskoy maznacheniya na baze personal'nykh EVM" *Pribory i sistemy upravleniya*, 3, 1986, 10-11.
- Kolomiets, G. S., and Naroditskaya, L. Ia., Opyt sozdaniya ARM i sistem projektirovaniya i kontrolya sredstv vychislitel'noy tekhniki *Pribory i sistemy upravleniya*, 7, 1986, pp. 44-46.
- Prokhorov, N. L., and Smirnov, E. B., Sm EVM: Sostaniye i perspektivy razvitiya, *Pribory i sistemy upravleniya*, 7, 1986, pp. 8-11.
- Landau, I. Ia., and Vagner, E. I., Avtomatizirovannyye rabochie mesta i novyye podkhody k avtomatizatsii projektirovaniya, in *Vychislitel'naya tekhnika sotsialisticheskikh stran*, Vypusk 8, 1980, pp. 111-116.
- Lapshin, Iu. P., *Razvitiye avtomatizirovannykh sistem upravleniya v promyshlennosti*, 1977, 271 Pp.
- Loginov, N., Kto zhe otladit stanok s ChPU?, *Ekonomicheskaya gazeta*, 2, (January), 1987, p. 10.
- Makarov, I. M., *Sistemnyye printsipy sozdaniya gibkikh avtomatizirovannykh proizvodstv*, Vol. 1 in the series of books, *Robototekhnika i gibkie avtomatizirovannyye proizvodstva*, 1986, 175 Pp.
- Makarov, E., Kompleksnaya avtomatizatsiya na osnove gibkikh avtomatizirovannykh proizvodstv, in *Problemy mashinostroyeniya i avtomatizatsii*, 5, 1985, pp. 7-17.
- Maksimenko, V. I., (ed.) *Gosudarstvennaya set' vychislitel'nykh Tsentrov*, 1982, 276 pp.
- Maksimenko, V. I., Effektivnost' primeniya vychislitel'noy tekhniki v narodnom khoziaistve, *Vychislitel'naya tekhnika sotsialisticheskikh stran*, Vypusk 16, 1984, pp. 86-94.
- Marchuk, G. I., Nekotorye problemy razvitiya gosudarstvennoy sistemy nauchno-tekhnicheskoy informatsii, *NTI*, Ser. 1, 1980, 11, pp. 1-4.
- Marchuk, G. I. et al., *Territorial'no-raspredelennyye mnogomashinnyye vychislitel'nyye tsentry kollektivnogo pol'zovaniya SO AN SSSR*, 1981, 59 pp.

- McHenry, W., *The Absorption of Computerized Management Information Systems in Soviet Enterprises*, Unpublished Ph.D. dissertation, University of Arizona, 1985, 730 Pp.
- Miasnikov, V. A. "Rabotaem na displee" *Ekonomicheskaya gazeta*, 15, April, 1986, p. 17.
- Miasnikov, V. A. "ASU tekhnologicheskimi protsessami" *Ekonomicheskaya gazeta*, 4, January, 1986, p. 14.
- Miasnikov, V. A., EVM i mikroprotsessory, *ELORG informiruet*, 6, 1983, pp. 5-6.
- Miasnikov, V. A., Vychislitel'naya tekhnika i avtomatizatsiya-osnova intensivifikatsii narodnogo khoziaistva, *Upravliaiushchie sistemy i mashiny*, 1982, 6, pp. 3-6.
- Mozhaveva, N. B. "Mekhanizatsiya i avtomatizatsiya vychislitel'nykh rabot," *Pribory i sistemy upravleniya*, 2, 1983, 41.
- Naumov, B., Osnovnye napravleniya razvitiia SM EVM, *ELORG informiruet*, 5, 1983, pp. 3-8.
- Norenkov, I. P., *SAPR: Sistemy avtomatizirovannogo proektirovaniia*, No. 1, Printsipy stroeniia i struktura, 1986, pp. 127.
- Parrott, B., Information Transfer in Soviet Science and Engineering, R-2667-ARPA, Rand Corporation, Santa Monica, November, 1981, 46 pp.
- Popov, E., Promyshlennaya robototekhnika i gibkie avtomatizirovannye proizvodstva, *Budushchee nauki*, Vyp. 18, 1985, pp. 140-152.
- Rezer, S. M., *Upravlenie transportnymi predpriiatiami*, 1982, 247 Pp.
- Salerno, L. M., What happened to the computer revolution? *Harvard Business Review*, November-December 1985, (63:6), pp. 129-138.
- Samarskii, A. A., Problemy ispol'zovaniia vychislitel'noi tekhniki i razvitiie informatiki, *Vestnik Akademii Nauk SSSR*, 1985, 3, pp. 57-69.
- Shkabardnia, M. S., Razvitiie otrasli i nauchno-tekhnicheskii progress, *Pribory i sistemy upravleniya*, 2, 1986, pp. 1-4.
- Shkabardnia, M. S., Novye rubezhi nauchno-tekhnicheskogo progressa, *Pribory i sistemy upravleniya*, 4, 1984, pp. 2-3.
- Shkabardnia, M. S., Sovremennye puti avtomatizatsii, *Pribory i sistemy upravleniya*, 11, 1983, pp. 1-3.
- Shtal', G. and Vul'st, I., Resultaty realizatsii sluzhb v seti vychislitel'nykh mashin, *Vychislitel'naya tekhnika sotsialisticheskikh stran*, Vypusk 17, 1985, pp. 116-122.
- Solomatin, V. V., Avtomatizatsiya upravleniya v nepromyshlennoi sfere, *Pribory i sistemy upravleniya*, 1986, 3, pp. 3-5.
- Toward a New Era in U.S. Manufacturing*, Manufacturing Studies Board, National Research Council, National Academy Press, Washington D.C., 1986, 174 Pp.
- TR-86-UCA-033, *Modern Soviet Civil Telecommunications*, Interim Report on Contract No. 9-165-Z5910-1, Prepared for Technology Transfer Intelligence Committee, February 18, 1986.
- Trapeznikov, V. A. "Nekotorye voprosy metodologii SAPR," *Pribory i sistemy upravleniya*, 3, 1986, 1-3.
- Vaganian, G. A., *Mashinnaya grafika v upravlenii*, 1985, 176 Pp.
- Val'denberg, Iu. S., (ed.) *Vychislitel'naya tekhnika dlia upravleniya proizvodstvennymi protsessami*, 1971, 479 Pp.
- Vishniakov, Iu., and Pomonarev, V. M., *Prikladnye voprosy sozdaniia informatsionno-vychislitel'nykh setei*, 1984, pp. 3-11.
- Zabara, A. A., et al., Tekhnicheskie sredstva ARM2-01, Pol'zovatel'skii aspekt ARM2-01, in Orlovskii, G. B., (ed.) *EVM v proektirovanii i proizvodstve: Sb. statei*, Vypusk 2, 1985, pp. 163-180.
- Zador, E., Mnogostoronnee sotrudnichestvo stran-chlenov SEV v oblasti gibkikh avtomatizirovannykh proizvodstv, in *Problemy mashinostroeniia i avtomatizatsii*, 5, 1985, pp. 3-6.
- Zavartseva, H. M. and Ivanova, S. V., Vesoiuznaia nauchno-tekhnicheskaya konferentsiia "Problemy sozdaniia i ispol'zovaniia mini i mikro-EVM," *Pribory i sistemy upravleniya*, 7, 1986, pp. 42-44.

THE PROSPECTIVE IMPACTS OF COMPUTING: SELECTED ECONOMIC-INDUSTRIAL-STRATEGIC ISSUES

By S.E. Goodman*

CONTENTS

	Page
I. Introduction.....	176
II. Industrial Modernization and Higher Productivity.....	177
III. Economic Planning	180
IV. Living Standards	181
V. Some US-USSR Military Implications	182
VI. Relative Superpower Status	183

SUMMARY

We present brief assessments of the prospects for the application of computing over the next 15 years in five selected economic, industrial, and strategic areas: industrial modernization and higher productivity, centralized planning and control, living standards, some US-USSR military implications, and relative superpower status.

I. INTRODUCTION

To meet the goals of its leadership in several economic, industrial, and strategic areas, it will be necessary for the Soviet Union to pursue more effective and widespread applications of the C&C (computing and communications) technologies than has been the case in the past. This paper briefly examines Soviet prospects to the end of the century in five selected areas: industrial modernization and higher productivity, economic planning, living standards, US-USSR military implications, and relative superpower status. We make no claim that either the range of issues considered or the coverage of any single issue is exhaustive.

The somewhat speculative assessments that follow assume the Soviet economy will develop as a hybrid of what has been described in [Berliner, 1984] and elsewhere as the conservative and progressive-liberal economic models. These are the two models roughly associated with the Soviet economy under Brezhnev and with the GDR presently.

Since spatial constraints preclude a review of the underlying assessments of recent Soviet progress, programs, and policies with regard to C&C, we are necessarily limited to a short reference list: Campbell, 1986; Dolan, 1985; Goodman, 1985; Goodman, 1986a;

*Professor of Management Information Systems and Policy, University of Arizona, Tucson.

Goodman, 1986b; Goodman and McHenry, 1986; Hammer et al., 1984; McHenry, 1985; McHenry and Goodman, 1986; Schroder and Vogel, 1986; Stapleton and Goodman, 1985; and other papers in this JEC volume. Much of this article is taken from chapter 4 of [Goodman, 1986b].

II. INDUSTRIAL MODERNIZATION AND HIGHER PRODUCTIVITY

These are among the Gorbachev administration's overarching goals, and success or failure here will greatly affect all four of the other issues. The proposed means for achievement involve a combination of greater discipline, the elimination of waste, and automation. The computer-related technologies—primarily in the forms of computer-aided design (CAD), computer-aided manufacturing (CAM), TPC (technical process control, the Soviet acronym is ASUTP: automated systems for the control of technical processes), MIS (management information systems) and OA (office automation)—have the potential for partially relieving the effects of a labor shortage, providing important forms of modernization and productivity improvements in the manufacturing, white-collar, and R&D sectors, increasing the volume and quality of goods produced, imposing additional discipline, and helping to eliminate waste. These applications have, by far, the highest profiles in the Soviet media, and are at the core of the Program for Computing to the Year 2000 [Goodman and McHenry, 1986].

The most important questions concerning the effects of systemic conditions on progress toward these goals are twofold. Will the Soviet C&C infrastructure (roughly the C&C industries and the relevant intra-enterprise organizations and their behavior patterns) be capable of providing the technology to support a broadly distributed industrial automation? Will the superstructure (the general Soviet economic, industrial, and political environment) problems that have plagued the ASUP (enterprise-level MIS) program for 20 years be much of an impediment [see the McHenry contribution to this JEC volume and McHenry, 1985; McHenry and Goodman, 1986]?

There are at least two plausible views as to whether or not socially pervasive applications are necessary to support a sufficient infrastructure to meet these goals. The first holds that the Soviet C&C industries are large and by no means impotent. They cover the full spectrum of the relevant technologies. As long as they are not expected to meet the combined overall Western standards of extent of applications, technological level, sophistication of integration and service, the Soviet industries might be able to perform at a reasonable level, both qualitatively and quantitatively, with some foreign technology transfer and additional resources. The Soviets should be able to build them up to the point where they at least better their marginal and undistinguished performance in support of the ASUP program.

According to this position, the need for a pervasive presence of microcomputers, entertainment applications, computer networks, etc. in Soviet society as a prerequisite for successful large scale industrial automation in the USSR has been exaggerated. The lack of private automobiles and telephones has not prevented Soviet indus-

try or the military from having a large number of trucks and tanks and field communications systems with adequately trained operators. Similarly, one can learn to tend an FMS (flexible manufacturing system) without having to have a microcomputer at home.

The second view holds that every stage of pervasiveness requires a corresponding support level from the infrastructure. It is the pervasiveness of applications (demand-pull) that stimulates the infrastructure to respond, just as a healthy infrastructure fosters demand by making applications possible (supply-push). One can learn to tend an FMS without having to have a microcomputer at home, but can the infrastructure provide sufficiently reliable microcomputers and other technologies without the demand base that home personal computers provide?

Our view is a hybrid. Significant resources will be added to the C&C industries to help them improve their performance and there will be improvements in infrastructure, but this will not be up to supporting near-universal applications in Soviet enterprises. However, more modest applications in selected sectors may be possible and adequate. Demand pull has never been sufficient to prod the C&C industries into overcoming certain fundamental deficiencies in hardware reliability and service, and for software development and support. The Soviets therefore might unfetter the demand side by (a) unleashing some forces of private industry within the infrastructure, or (b) allowing enterprises to act more autonomously, or (c) by providing more and better equipment and services on the supply side to help stimulate demand. To some extent, most of the recent computer-related policies of the Gorbachev administration represent initiatives along the lines of (b) and (c).

The creation of small, perhaps private, enterprises would help fill in the cracks in the infrastructure. Small software companies or service vendors might be allowed to promote technological innovation and improve the quality of services. Such companies would surely provide some services better, but might well run into the same barriers that would-be users now suffer from, especially with respect to obtaining and repairing hardware.

But most of Soviet industry has not yet reached a position where it is ready to obtain many of the benefits of the information technologies. For example, consider the technique of just-in-time production (JITP). JITP requires that production processes be so highly coordinated, well-timed, and well-executed that there is practically no margin for error and, as such, has given some US companies fits. But the Soviets, with their erratic supply system, could obtain greater gains merely by ensuring consistency in the arrival of most supplies and by making sure that everything supplied was of good quality. The USSR is said to be facing a labor shortage that will supposedly be relieved by automation, but anybody who has ever visited a Soviet store knows that there is plenty of underemployed labor. Within this environment, computing relieves some problems, but is also an additional form of inefficiency itself and exposes others that it cannot correct.

The leadership may hope to overcome these problems through some structural changes and technological improvements, and through the exposure of younger workers and managers to the information technologies at work and school. These people may make

more effective use of what there is and create some constructive demand from below in the short term, and perhaps see to better solutions in the long term. This seems to be the view held by several prominent academicians and technocrats, and they are gaining support, perhaps because there is no better and feasible alternative at this time. Consider, for example, the frustration and hope expressed by the director of a major Georgian ASU institute:

Unfortunately, today the real interest in ASU has significantly diminished, and this is at the moment when we have sufficiently powerful hardware and software and data processing technology to make it possible to satisfy the needs of economic management. Sharp changes in the practice of the use of ASU can be expected with the arrival of the new generation, the new type of manager-commanders of production and workers of the management apparatus, who today, in the 9th and 10th classes, are grasping general computer literacy [EMM, 1985b].

There are risks that such programs might lead Soviet society further away from computing if they are not carried out well. Some experienced enterprise directors may have more misgivings about using computers now than they did 20 years ago [EMM, 1985a; EMM, 1985b]. Potential for similar disillusionment exists in the program for industrial automation.

The limited prospects for sweeping solutions to these important superstructural and infrastructural problems will make it impossible for the USSR to effectively introduce widespread automation into most of its industry and commerce by the end of the century. Strong testimony to this effect is given by the legacy of the introduction of computing into Soviet enterprises and R&D organizations over more than 20 years [Mchenry, 1985]. It is questionable if they will do much better with the larger, more complicated, and riskier problem of industrial automation.

This is not to say that little or nothing will be done. The Soviets have no choice but to try hard, and something will come of the effort. In the short term, there will be several prominent and perhaps exaggerated successes, but serious initial work and experimentation will take place both in high priority military-industrial and in lesser sectors. In time, we would expect islands of advanced industrial automation to emerge. The rest, probably most, of Soviet industry will be left behind in a backwater that will be more distanced from the advanced sectors than is the case today. The selection process will no doubt reflect the priorities given to other basic economic, military and social goals. We would expect to see the most rapid rate of introduction in ASUTP/TPC, with more than 700 additional systems per year [National Economy, 1985], and this rate can be expected to increase as a result of better and cheaper hardware and the emphasis placed on this area under Gorbachev. By the end of the century most important, well-understood, and not exorbitantly expensive processes may be partially computer controlled. The introduction of ASUP will continue to have problems along the lines already discussed, and will be introduced at the slowest rate and perhaps with the least effect. The introduction of robots and FMS will be at a rate between the first two, with the rate for robots being faster than that for FMS and other more integrated forms of CAM. Even this level of success would go far to vindicate central planning and control and "discipline" as effective ways for running a country.

III. ECONOMIC PLANNING

The USSR appears to be more strongly wedded to comprehensive central planning than China or most of Eastern Europe. The reasons are historical, ideological, and political. In particular, this may be the Soviet Union's most notable economic innovation, and it would be very difficult for the Soviets to back away from it. Some continue to see centralized planning as having great potential to help use resources optimally, and to increase output and productivity. Others may see it as an important form of political and information control. In any case, in the effort to maintain close control over an increasingly complex economic domain and planning process there is little choice but to turn to the C&C technologies. If there is anything that can be seen as a singularly Soviet economic element of an information society, this is it.

The Soviets may be expected to continue to at least talk about and partially implement The All-Union System for the Collection and Processing of Information for Accounting, Planning, and Management of the National Economy (OGAS) and other state committee and ministry-level systems [Cave, 1980; Cave, 1982; Conyngham, 1980; Mchenry, 1985]. The fundamental problems to be faced again involve the ability of the infrastructure to deliver the necessary product and service support and the ability of the host environments to absorb the applications. However, by the Year 2000 there will probably be a substantial amount of data exchange via telecommunications between these systems, and data base management technologies will be widely used. Computers will become almost universal in the TsSU (Central Statistical Administration) system, which will be used to collect and process data from the majority of enterprises.

Three serious problems arise from the surrounding environment. First, the whole planning and control mechanism is a highly political process. Despite efforts to computerize Gosplan since the early 60s, most of the automation simply replaces the calculators of yesterday without changing the methods used to balance the plan. Are Soviet planners really ready to allow a computer to make decisions for them when their decisionmaking power is their most valuable possession? Will planners who are concerned about gross inconsistencies be interested in using computers to fine-tune plans? Some improvements in the political and professional environment are to be expected, but not miracles.

Second, computerization does not substantially change the nature of the data which is being collected, nor does it address the problem of collecting data in machine readable form. The TsSU collects the same data and simply processes and delivers it faster. To what extent is this data accurate? This question cannot be answered with any certainty, but at any given time there is probably a good deal of incorrect data in circulation. Branch autonomy may also hinder links between various systems and the sharing of accurate data, which may be one reason superministries are being created.

Finally, there is the problem of planning from the achieved level, on which much of the incentive system is based. It is too difficult, even with computers, to determine from scratch what each econom-

ic unit should be producing. Solving this kind of problem involves repeated iterations of balancing global and local optimal solutions across tens of thousands of organizational units; it has not even been solved for organizations as simple as a single oil company with multiple refineries. Supercomputers that would be capable of doing this over many sectors of the Soviet economy will probably be unavailable for some time to come. Planning from the achieved level results in an enormous amount of inertia and has given rise to gross structural imbalances in the Soviet economy. The choices which could be made by using computers are severely limited. There has been talk about changing this feature of the superstructure, but so far no clear and effective alternatives are being widely implemented. It is also difficult to foresee major near- and intermediate-term improvements in the very important related problem of applying computers to help determine rational prices.

More pervasive use of computers for economic control might take forms that would yield some results. For instance, the maintenance of large data bases of the reported information may help the central authorities uncover reporting inconsistencies and track down phoney data. Planners should be able to make more use of the available data for analysis purposes. Faster reporting and analysis will be possible, so that some more timely decisions may be forthcoming.

It might be possible to solve some of the false data problems by using direct, sensor-based collection methods. This would be enormously expensive, and would require that computing be used at all levels of the hierarchy, down to the shop floor, on a near-universal basis. It would also require a tremendous telecommunications infrastructure. This kind of universal and effective economic surveillance will not become reality by the end of the century.

We expect that there will be improvements in the overall performance of the economic control and planning mechanism, but that these gains will fall far short of what the Soviet leadership desires. Computers will help the central planners to keep up with the growing volume of data and to have somewhat more control over the complexity of the economy. But the planning process will still be constrained by all the problems just noted, and will still be shot through with politics. Large scale optimal plans and pricing will remain out of reach.

IV. LIVING STANDARDS

An improved standard of living should be more than just a positive incentive towards achieving state goals. It is an important goal in itself, and the most important the vast majority of citizens see as individuals.

Even if the Soviets should be modestly successful in attaining the economic goals briefly discussed above, the gap between the relative Western-USSR standards of living may grow for the rest of this century. The information technologies have been contributing to some dramatic and high profile changes in this gap. This trend may be accelerated in spite of prospective Soviet improvements, the Gorbachev administration's real interest in increasing domestic

consumption, and the need to come up with entertainment options to fill some of the time that has been spent with vodka.

Most of the West is now well beyond minimum subsistence levels for housing, food and education. Standard of living is increasingly a matter of range of choice and availability of services and products, greater career and leisure time opportunities, more personal communications, the quantitative and qualitative expansion of entertainment possibilities, etc. In these terms, a more efficient industrial economy as seemingly defined by the Gorbachev administration will not provide a great improvement in standard of living for most of the Soviet people.

The information technologies are making it possible for the Western set of products, services and opportunities to expand rapidly in both quality and quantity. The Soviet subset is expanding much more slowly. In a world where the variety and volume of electronics-based consumer products and services are growing at unprecedented rates, the USSR is producing little and exporting less of what others really want to directly improve their standards of living. Imports are limited to items for the upper levels of society and for the never ending, never really successful, goal of strengthening industrial sectors that need more than what Soviet indigenous technology can provide. The USSR chooses to constrain its citizens' opportunities by remaining outside of a world that is increasingly capable and increasingly inclined to communicate among its components. To do otherwise would be to weaken the internal position of the Party and to inevitably permit some political deviations. In the past, when the stakes were more modest technologically and with the more limited extent of the technological interface with daily life (e.g., photocopying machines), it was relatively easy for the leadership to impose strong and fairly effective controls. Now the cost and pace are much higher, and this East-West gap is growing, and a significant part of the population is aware of it.

V. SOME US-USSR MILITARY IMPLICATIONS

The US is increasingly setting the pace and directions with regard to the military applications of the information technologies. US successes and failures determine the relative Soviet position and the way the game is played at least as much as anything the Soviets themselves do. In our view, the converse statement, i.e., regarding Soviet determinants on the US, is weaker.

For at least the rest of this century, it is unlikely that Soviet progress in the C&C technologies will strengthen them to the point where they can broadly catch up with or surpass Western military applications. In order for that to happen, we believe the West must stumble or fall down. For example, if the West fails in the development of SDI, the Soviets may be able to close some of the gaps in military applications because the West will have wasted scarce resources that would have been better used elsewhere. On the other hand, if the West succeeds with SDI, the USSR will not have the overall C&C capabilities to match it (especially in the areas of large scale software development and real-time systems integration). The most sensible plan, given Soviet accomplishments, limitations, pros-

pects, and the importance of these technologies to an SDI-like effort, would seem to be to invest the necessary resources to counter, rather than match, an SDI system. An obvious possibility is to try to overwhelm it by using less sophisticated technologies than SDI itself employs. The Soviets might also continue a fairly modest SDI-like effort to keep some options open and to try to give Western analysts the impression of having a more advanced and successful program than may actually be the case. It is possible that, in the case of SDI, the West might be trying to press its technological advantages too hard, and the net result may be poorer risk-to-gain prospects than what the US is, in effect, forcing on the Soviets.

The Western lead across a broad spectrum of security-related applications of the C&C technologies is such that the USSR will continue to have to rely on a wide range of technology transfer mechanisms to keep this gap from growing more rapidly.

VI. RELATIVE SUPERPOWER STATUS

Will the different uses of the C&C technologies in the US and USSR strengthen or weaken the relative position of the Soviet Union as a superpower?

Virtually all analyses of the different uses of the information technologies in the US and USSR would seem to indicate a weakened relative position of the USSR as a superpower, at least within the domains where these applications influence such status, and that this is likely to continue for the rest of the century. We conclude by briefly noting that relative US-USSR positions as superpowers may also change due to a weakening of the US position.

The information technologies will tend to decentralize Western leadership. For example, Japanese progress is such that they have already and will continue to partially displace the US as the most technically and economically advanced of the Western countries. More generally, capabilities in the C&C technologies are diffusing rapidly among the advanced, and some not-so-advanced, countries, and it is not hard to envision a future world economic-technological order dominated by four power-sectors (Europe, the Far East, the US and the USSR). This comparative weakening of US leadership may make it more difficult for the West to act collectively on East-West matters.

There is also some serious potential for Soviet gains relative to the US information industries and applications in manufacturing, but not against the West as a whole, because of the decline in US technological leadership. In particular, the US is in risk of losing important parts of domestic industries due to their inability to stand up against foreign competition in domestic and international markets. This has already happened in semiconductors, computer peripherals, CNC machine tools and other areas. The US is becoming increasingly vulnerable and building undesirable dependencies in this sense. Soviet forms of control of their own economy allow them to maintain a complete set of industries, even if they are not competitive by worldwide standards.

The information technologies may be weakening the positions of both superpowers.

REFERENCES

- Berliner, Joseph S., "Planning and Management," Chapter 18 of *The Soviet Polity in the Modern Era*, Hoffman, Erik P., Laird, Robbin F., Eds., Aldine Publishing Company, New York, 1984, 476-509.
- Campbell, Robert, "Current Party Plans for Developing Telecommunications," Presentation at the IREX/USIA Conference on Communications and Control in the USSR, Washington, DC, September 17, 1986.
- Cave, Martin, *Computers and Economic Planning: The Soviet Experience*, Cambridge University Press, Cambridge, 1980.
- Cave, Martin, "Innovation Aspects of the Management Automation Programme in the Soviet Union," Chapter 5 in *Industrial Innovation in the Soviet Union*, Amann, Ronald, Cooper, Julian, Eds., Yale U. Press, New Haven, CT, 1982., 212-241.
- Conyngham, William J., "Technology and Decision Making: Some Aspects of the Development of OGAS," *Slavic Review* v. 39, 3 (Fall, 1980), 426-445.
- Dolan, John Mark, "The Soviet Robotics Program," University of Arizona, Department of MIS Report, August 15, 1985, 77 pages.
- "Round Table of the Editors: Problems and Prospects for the Development of Automated Management Systems," *Ekonomika i Matematicheskiye Metody* v. XXI, 3 (May-June, 1985a), 542-556.
- "Round Table of the Editors: Problems and Prospects for the Development of Automated Management Systems (continued)," *Ekonomika i Matematicheskiye Metody* v. XXI, 5 (Sep.-Oct., 1985b), 920-934.
- Goodman, S. E., "Technology Transfer and the Development of the Soviet Computer Industry," in *Trade, Technology, and Soviet-American Relations*, Parrott, Bruce, Ed., Indiana U. Press, Bloomington, IN, 1985, 117-140.
- Goodman, Seymour E., "The Partial Integration of the CEMA Computer Industries: An Overview," in *East European Economies: Slow Growth in the 1980s. Volume 2. Foreign Trade and International Finance*, Hardt, John P., Kaufman, Richard F., Eds., Joint Economic Committee, Congress of the U.S., U.S. Govt. Printing Office, Washington, D.C., March 28, 1986a, 329-354.
- Goodman, S. E., "The Information Technologies in Soviet Society: Problems and Prospects," University of Arizona, Department of MIS Report, July 29, 1986b, 102 pages, to appear in *EEE Trans. SMC*, 1987.
- Goodman, S. E., McHenry, W. K., "Computing in the USSR: Recent Progress and Policies," *Soviet Economy*, 1986, 2, 4, 327.
- Hammer, C., Dale, A. G., Feldman, M. B., Goodman, S. E., McHenry, W. K., Schwartz, J., Walker, S. T., Winograd, S., "Soviet Computer Science Research," FASAC-TAR-2020, Washington, D.C., July 31, 1984.
- McHenry, William K., "The Absorption of Computerized Management Information Systems in Soviet Enterprises," Ph.D. Dissertation, University of Arizona, 1985.
- McHenry, W. K., Goodman, S. E., "MIS in USSR Industrial Enterprises: The Limits of Reform from Above," *Communications of the Association for Computing Machinery* v. 29, 11 (Nov., 1986), 1034-1043.
- National Economy of the USSR in 1985*. Moscow: Finansy i statistika, 1986.
- Schroder, Hans-Henning, Vogel, Heinrich, "Security Aspects of Science and Technology in the USSR," Draft paper prepared for the NATO Workshop on "National Security Issues After the 27th Party Congress of the USSR," Brussels, Belgium, November 6-7, 1986.
- Stapleton, Ross Alan, Goodman, Seymour, "Microcomputing in the Soviet Union and Eastern Europe," *Abacus* v. 3, 1 (Fall 1985), 6-22.

THE INTEGRATION OF MANAGEMENT INFORMATION SYSTEMS IN SOVIET ENTERPRISES

By Williams K. McHenry¹

CONTENTS

	Page
I. The Enterprise Automated Management System Program.....	185
A. Goals and Results to Date.....	185
B. The Role of the Computing Infrastructure.....	186
II. Challenges of Integrating ASUP in the Soviet Management Milieu.....	188
A. Material-Technical Supply.....	188
B. Production Management.....	190
C. Accounting.....	192
D. Planning.....	195
III. The ASUP Program Under Gorbachev.....	197
A. Trends.....	197
B. Prospects for Improvement.....	197

SUMMARY

Over the past two decades the Soviet Union has engaged in an ambitious program to incorporate computing in enterprise management. Inadequate support from the infrastructure is partially responsible for the limited results achieved so far. More important have been the constraints imposed by the economic environment. These limitations are examined in four areas: supply, production management, accounting, and planning. In each area some ways have been found to increase data processing efficiency, but large increases in effectiveness have not been realized. The Gorbachev reform measures will undoubtedly improve the computing infrastructure, but are not yet sweeping enough to change the fundamental incentives which limit demand for computing management applications.

I. THE ENTERPRISE AUTOMATED MANAGEMENT SYSTEM PROGRAM

A. GOALS AND RESULTS TO DATE

In 1966, the Soviet Union launched what would become an ambitious program to reform economic management by installing computers at all levels of the economy. The cornerstone of this program was the enterprise automated management system (ASUP). By the end of 1985, more than 3,600 ASUPs had been installed, pri-

¹ School of Business Administration, Georgetown University, Washington, DC.

The author wishes to thank the Department of Management Information Systems, University of Arizona, for support in the preparation of this paper.

marily in the heavy industry sectors.² Not only was the ASUP intended to significantly increase the efficiency of management by eliminating manual and mechanized calculating work, it was to "naturally grow into the structure of management, becoming its foundation, and the means by which it will function on a higher level." In this manner the ASUP would "guarantee the fastest transfer of the best practical experience from one organization to others, the use of well-designed and well-tested modules in management systems, and the choice of optimal decisions on the basis of using a greater quantity of information. . . ."³

By both qualitative and quantitative measures, the ASUP program has fallen short of its goals. Of the approximately 44,000 industrial enterprises now in the USSR, only 8.4 percent have a SUPs. The number of ASUPs appears minuscule when compared to the approximately 580,000 enterprises, organizations, and institutions that the Soviets say have a need for computing in management applications.⁴ However, since about one third of Soviet enterprises with more than 500 employees have ASUPs, they cover a disproportionately large percentage of overall production. At current rates of introduction of about 200-300 ASUPs per year, less than one quarter of all Soviet industrial enterprise will have them by the year 2000.

For the most part, ASUPs have failed to significantly alter the way that Soviet enterprises are managed, and thus have failed to bring about the desired improvements in effectiveness. The main achievements have been in increasing the efficiency of the data processing part of the management information system, although in some cases overall efficiency has actually been reduced. Basic data processing systems have been built in areas such as scheduling and tracking of production status, calculation of the annual plan, production engineering, and management of sales and inventory.⁵

B. THE ROLE OF THE COMPUTING INFRASTRUCTURE

The successful intergration of computing technology into an enterprise requires both sufficient technical support in the form of an infrastructure which can provide reliable hardware, software, and service, and an environment which is amenable to computerization.

In the early stages of the ASUP program, Soviet industry provided second-generation transistor computers without direct access storage devices. Over the past 15 years the Soviets have chosen functional duplication of foreign computer models as a means to follow a low risk technology development plan and to use Western

² *Narodnoye khozyaystvo SSSR v 1982 godu, statisticheskiy yezhegodnik*, Finansy i statistika, Moscow, 1983; *Narodnoye khozyaystvo SSSR v 1985 godu, statisticheskiy yezhegodnik*, Finansy i statistika, Moscow, 1986.

³ "Krugliy stol redaktsii: problemy razvitiya avtomatizirovannykh sistem upravleniya," *Ekonomika i matematicheskiye metody* v. X, 6, Nov.-Dec., 1974, 1202-1203.

⁴ Simchera, V., "Ispol'zovaniye vychislitel'noy tekhniki v narodnom khozyaystve," *Voprosy ekonomiki*, No. 6, July 1984, 55-60.

⁵ Other ASUP functions have included: quality control, management of auxiliary production, personnel, finance, long-range planning, wages and labor, order execution, dispatching, and norms. See McHenry, William K., *The Absorption of Computerized Management Information Systems in Soviet Enterprises*, Ph.D. Dissertation, University of Arizona, 1985.

software.⁶ A network of institutes under the USSR All-Union Ministry of Instrument Construction, Means of Automation, and Control System (Minpribor) is tasked with writing ASUP software in conjunction with institutes from other branches. When available, hardware maintenance services have been provided either by national organizations run by the computer producers by local organizations, or by in-house groups. Software maintenance is largely done in-house.

The effects of problems with the infrastructure were primary the following:

1. A reduced scope of applications that could be implemented and longer development times because of slow, unreliable hardware, small main memory sizes, and small disk sizes;
2. The inability to completely rely on the computer because of hardware failures and difficulty of obtaining service;
3. Increased costs due to the necessity to maintain hardware and software locally, and to fill in the gaps left by the infrastructure;
4. The difficulty of obtaining new machines and help in migrating from old ones, leading to a tendency to hang onto old systems longer than necessary;
5. The inability to procure packaged software, leading to increased local development of relatively poorly tested and documented programs;
6. Poor relations with software providers, leading to incorrect specifications and the delivery of unusable products; and
7. Poor user training and difficult-to-use systems which alienated users.

At present, large disk drives, terminals, data communications peripherals, and the largest mainframe models are still in short supply.⁷ The mainframe models that are in widest use still break down about once a week.⁸ It has been estimated that to bring about the massive introduction of microcomputers throughout the economy, models that are at least two orders of magnitude more reliable than these mainframes will have to be created.⁹ Only this year have the Soviets started to cross the threshold into larger capacity sealed disk drives. The new State Committee on Computer Technology and Informatics (GKVTI) will establish a new nationwide chain of service organizations which may considerably shore up this part of the infrastructure.¹⁰

⁶ Davis, N.C., Goodman, S. E., "The Soviet Bloc's Unified System of Computers," *Computing Surveys* v. 10, 2, June, 1978, 93-122; Hamner, C., Dale, A. G., Feldman, M. B., Goodman, S. E., McHenry, W. K., Schwartz, J., Walker, S. T., Winograd, S., "Soviet Computer Science Research," FASAC-TAR-2020, Washington, D.C., July 31, 1984.

⁷ Chumachenko, N. G., et al. *Organizatsionnyye formy ispol'zovaniya EVM*, Naukova Dumka, Kiev, 1984; "Krugliy stol redaktsii: problemy i perspektivy razvitiya avtomatizirovannykh sistem upravleniya," *Ekonomika i matematicheskiye metody* v. XXI, 3, May-June, 1985a, 542-556; Skachkov, V., "V poiskakh mashinogo vremeni," *Ekonomicheskaya gazeta*, No. 3, Jan. 1986, 12.

⁸ Semonov, V. A., Shumilin, V. F., "Nadezhnost' raboty universal'nykh EVM III pokoleniya," *Energetika i elektrifikatsiya, Seriya: sredstva i sistemy upravleniya v energetike* 9, Sept., 1984, 13-17.

⁹ Gromov, G., "The Maxi-Problem of Microprocessors," *Izvestiya*, Jul. 20, 1985, 2, translated in *Current Digest of the Soviet Press*, v. XXXVII, 29, 1985, 15-16.

¹⁰ Denisov, V., "Effektivneye ispol'zovat' komp'yuternuyu tekhniku," *Ekonomicheskaya gazeta*, No. 18, Apr., 1986, 5.

The shortcomings of the infrastructure continue to constrain ASUP. However, even if the Soviets had a significantly better infrastructure, they would still have considerable difficulty in reaching the goals of the ASUP program.

II. CHALLENGES OF INTEGRATING ASUP IN THE SOVIET MANAGEMENT MILIEU

Four of the most widely implemented functions in ASUP, using the Soviet names and acronyms, are material-technical supply (MTS), operational management of basic production (OUOP), accounting, and planning. Together they account for almost all of the basic operations in the production cycle: constructing initial and corrected five-year and yearly plan estimates, estimating needs for supplies and keeping track of inventories, scheduling and tracking production, and accounting for all the activities of the enterprise. Each has met with a particular set of environmental problems which has limited its usefulness.

A. MATERIAL-TECHNICAL SUPPLY

The chief characteristic of the supply system in the USSR for producer goods is perennial shortages brought about by taut plans. Shortages lead to a climate of uncertainty, changes in output mixes, poorer quality goods, the use of expeditors to obtain goods, and a host of other practices that generally fall outside the bounds of legitimate managerial activities.

Applications of computing to supply problems can be divided into those concerned with formulating the yearly supply plan and those dealing with maintenance of inventories. During the planning process, the enterprise has direct control only over the requirements statement drawn up by its purchasing department.¹¹ Negotiations with the ministry for sufficient supplies to ensure that plan targets can be met are therefore of great importance.¹²

On the one hand, calculating supply needs would seem to be an ideal ASUP application. In enterprises without significant data processing capabilities, the MTS department can be overburdened with information leading to errors, delays, and the inability to carry out calculations for optimization, more than one scenario, and daily or short-horizon use. Requirements must be defined well in advance because of the tremendous calculations involved.¹³ Recent evidence indicates that technical oversight of enterprises at the ministry level is becoming more sophisticated, so that only through well-supported calculations can an enterprise succeed in negotiating higher allocations.¹⁴ Because of the symbolic legitimacy attached to computer output and the convenience of doing multiple calculations during the planning process, the incentives to use this part of the ASUP would seem to be large.

¹¹ Berliner, Joseph S., *The Innovation Decision in Soviet Industry*, MIT Press, Cambridge, MA, 1976.

¹² Linz, Susan J., "Managerial Autonomy in Soviet Firms," Soviet Interview Project Working Paper 18, April, 1986.

¹³ Sokolitsyn, S.A., Dubolazov, V. A., *Avtomatizirovannye sistemy upravleniya mashinostroitel'nykh predpriyatiyem*, Izdatel'stvo Leningradskogo universiteta, Leningrad, 1980.

¹⁴ Linz, Managerial Autonomy, 1986.

On the other hand, the standard methodology of formulating supply requests in ASUP, which uses lists of parts which comprise every product to produce total estimates of supply needs, presents definite problems for the enterprise. Enterprise directors would like to pad the requests in order to include a safety factor. In a computerized environment, this could entail systematically falsifying data, e.g. for how much material is required to produce a certain good, or altering selected computer outputs.¹⁵ The former solution would result in inconsistent data in various parts of the data base or in the propagation of errors to other calculations. The latter solution might be easy to detect. Currently, enterprises that are caught falsifying data can sometimes use "calculating errors" as an excuse; presumably this would be more difficult to pull off in a computerized environment.¹⁶

Planning from the achieved level, which is still the principle planning technique, may render computer calculations irrelevant or unnecessary. Here the ministry faces a dilemma, because if it does ascribe greater legitimacy to computerized requests, enterprises would be given an effective license to pad. In the case of Barnaul Radio Factory, which has one of the most widely publicized ASUPs, the ministry continued to cut allocation requests even when accurate computer reports were supplied.¹⁷ In other cases, the ministry insisted on plans that were proven by computer to be unfulfillable.

Once the yearly plan has been defined, the computer can be used for inventory maintenance tasks. In the West, a major goal of manufacturing resources planning (MRP-II) system is to combine information about demand, goods on hand, and production capacity to minimize inventory carrying costs while ensuring smooth production processes. Such applications require accurate databases. Many of the reports which are produced by the MTS subsystem in ASUP concern current stock levels, but even here there are often substantial discrepancies between the database and actual stock.¹⁸

More importantly, MRP-II assumes an environment in which orders can be placed at will in order to respond to changing conditions. Soviet inventory levels are "basically defined by the lot size of the delivery, which depends on the producer and the transportation system."¹⁹ At the L'vov TV Plant, which sports one of the premier ASUPs in the Soviet Union, a computerized production monitoring system was set up which was designed for supply precision of minutes. However, supplies would be planned with a precision of three to four months. Consequently, worker time losses, which were supposed to be significantly reduced by the ASUP, barely changed.²⁰ In any case, norms for transitory stocks of pro-

¹⁵ Bunich, P., "Tsentralizovannoye upravleniye i samostoyatel'nost' proizvodstvennykh kollektivov," *Voprosy ekonomiki*, No. 9, Sept. 1985, 48-58.

¹⁶ Linz, *Managerial Autonomy*, 1986.

¹⁷ Podkopyayev, V. S., "Boleye shirokiye vozmozhnosti," *Ekonomika i organizatsiya promyshlennogo proizvodstva*, No. 5, May, 1979, 71-74.

¹⁸ "Krugliy stol redaktsii: prolemy i perspektivy razvitiya avtomatizirovannykh sistem upravleniya (prodolzheniye)," *Ekonomika i matematicheskiye metody*, v. XXI, 4, July-Aug., 1985b, 740-754.

¹⁹ Sokolitsyn and Dubolazov, *Avtomatizirovannyye sistemy upravleniya mashinostroitel'nykh predpriyatiyem*, 1980, 230.

²⁰ *Vitchyzna*, No. 3, Mar. 1981, 160-166.

duction goods are established by directive from above rather than being determined on the basis of many dynamic factors.²¹ Managers have a greater desire to fulfill basic plan targets than to meet targets for reducing inventories. The lack of enterprise autonomy excludes the most sophisticated inventory planning and maintenance techniques.

Some Soviets hoped that the computer could be used to overcome some of the difficulties with the supply system. S. Golobokov, for example, hoped that including transportation costs in calculations for optimal delivery sizes, formulating a computer-generated graph that would nail down an hourly delivery schedule, and keeping track of suppliers' shipments would provide a means of forcing suppliers to be more responsive to producers' needs.²² In 1983, Golobokov wrote a scathing assessment of the supply situation in metallurgy, reaching the conclusion that under current supply conditions, no electronic computers will help at all.²³ Both the suppliers and the railroad, who could fulfill their plans without regard to the final result, were at fault for wide variations in reception of supplies. Golobokov concludes:

The slow renovation of organizational fundamentals of administration of the enterprise provides rich soil for the development of false methods of solving problems. Certain managers still place great hopes in the utilization of electronic computers for strengthening of economic ties. This is partially explained by the considerable number of technical specialists who are engaged in economic and administrative problems. These ideas are quite common among specialists of information and computer centers in nonferrous metallurgy. But the solution to organizational and economic problems cannot be reached by technical and economic-mathematical methods alone.²⁴

Despite various changes in economic incentives, fundamental disruptions in supplies are likely to continue as long as the plan is taut and supplies are planned centrally.²⁵ The 12th Five-Year Plan is one of the most taut in recent history.

B. PRODUCTION MANAGEMENT

Many Soviet authors consider production management in general, and the operational (or short-term) management of basic production (OUOP) subsystem in particular, to be of greatest importance in ASUP.²⁶ A survey of a number of Soviet enterprises showed that about 40 percent of production losses were due to lack of synchronization of production, and poor coordination and incomplete organization of supply. The OUOP subsystem is said to be able to reduce production losses by 50-60 percent.²⁷ Experts sur-

²¹ Golobokov, S.A., *ASU material'no-tekhnicheskim snabzheniem metallurgicheskogo predpriyatiya*, Metallurgiya, Moscow, 1980; Sokolitsyn and Dubolazov, *Avtomatizirovannye sistemy upravleniya mashinostroitel'nykh predpriyatiyem*, 1980.

²² Golobokov, *ASU material'no-tekhnicheskim*, 1980.

²³ Golobokov, S.A., "Postavshchik-doroga-potrebitel': u sekhn raznyye interesy . . .," *Ekonomika i organizatsiya promyshlennogo proizvodstva*, No. 1, Jan., 1983, 35-43.

²⁴ Golobokov, *Postavshchik-doroga*, 1983.

²⁵ Berliner, *Innovation Decision*, 1976; Dyker, David A., "Technical Progress and the Industrial Planning Experiment," *Radio Liberty Research Bulletin* No. 42, Oct. 3, 1985, 1-6; Schroeder, Gertrude E., "Soviet Economic 'Reform' Decrees: More Steps on the Treadmill," in John P. Hardt, ed., *Soviet Economy in the 1980s: Problems and Prospects*, Joint Economic Committee, US Congress, U.S. Government Printing Office, Washington, D.C., Dec. 31, 1982, 65-88.

²⁶ Sinyak, V. S., et al., *Avtomatizirovannye sistemy upravleniya i rukovoditel'*, Sinyak, V.S., Ed., Statistika, Moscow, 1983; Sokolitsyn and Dubolazov, *Avtomatizirovannye sistemy upravleniya mashinostroitel'nykh predpriyatiyem*, 1980.

²⁷ Mamikonov, A.G., *Osnovy postroyeniya ASU*, Vyshaya shkola, Moscow, 1981.

vayed in 1983 used results from a survey of 103 enterprises as a starting point, and concluded that savings such as a 7.35 percent reduction in waste, and reductions in outlays of three, seven and four percent for equipment, shop outlays, and enterprise outlays, respectively, are possible.²⁸ The evidence that such gains have been realized, however, is inconclusive. Most of it is based on formal calculations of "economic effectiveness" which are at best problematical, and at worst, deliberate distortions.²⁹

Unlike Western production management systems, which are often called MRP-II and integrate functions spanning order entry, inventory management, accounting, purchasing, and shipping, Soviet operational management systems have been concerned for the most part with only two of these functions, planning and accounting. ASUPs in the 1970's were often delivered with a number of discrete subsystems, each of which contained a relatively small number of applications. A great deal of the old work scheduling system remained intact, precluding the use of capacity planning and optimization techniques.³⁰

The planning tasks which were considered typical for operational management in the early 1980's included taking production targets and translating them into specific targets for subassemblies and parts, and creating calendar plans for production, assembly, release, and acceptance of parts and assemblies.³¹ Optimization was still excluded because capacity planning and inventory modules were not integrated. Only within the past two years have descriptions of multi-level, multi-machine, on-line management information systems appeared in the Soviet press.³² It is only when sufficient terminals are located on the shop floor that sufficient data can be collected in order to make detailed planning models possible. Thus, it appears that Soviet operational management systems have not reached the level of sophistication of Western MRP systems which have been adopted in numerous corporations since the late 1970's.³³

Generally, one of the major advantages of MRP-II is considered to be the ability to quickly recalculate plans based on changing conditions. Soviet enterprises have some ability to negotiate changed monthly targets, but yearly targets are rather firm.³⁴ If supplies are late, a recalculated plan may be of no value because it does not match up with the (unchanged) official plan. Optimal operational plans calculated in the oil industry, for instance, bore no relationship to the official targets set from above, so that in practice workers followed the plans handed down from above in order to obtain bonuses.³⁵

²⁸ Kruchinin, I.A., et al. "Pozadachnye otsenki ekonomicheskoy effektivnosti ASUP," *Pribory i sistemy upravleniya* No. 1, Jan., 1983, 43-45.

²⁹ McHenry, *Absorption*, 1985.

³⁰ McHenry, *Absorption*, 1985.

³¹ Kruchinin, *Pozadachnye otsenki*, 1983.

³² For example, see: Lapin, L.G. "Avtomatizirovannaya sistema ucheta proizvodstva," *Pribory i sistemy upravleniya* No. 5, May, 1984, 10-11.

³³ Hoard, Bruce, "Study: 80% of Manufacturers Use or Plan DP," *Computerworld*, Apr. 27, 1981, 10.

³⁴ Linz, *Managerial Autonomy*, 1986.

³⁵ Berezovskiy, V. A., et al., *Opyt razrabotki i unedreniya avtomatizirovannykh sistem upravleniya neftepererabatyvayushchimi proizvodstvami*, Tsentral'nyy nauchno-issledovatel'skiy institut informatsii i tekhniko-ekonomicheskikh issledovaniy neftepererabatyvayushchey i neftekhimicheskoy promyshlennosti, Moscow, 1982.

Planning calculations are based on a huge number of norms which are in the database. In addition to the fact that the norms may be set externally, and thus reflect branch-wide standards or levels of performance which are unobtainable in practice,³⁶ it is doubtful that norms are changed to reflect temporary environmental changes. For example, a foreman may choose to use less metal in a good than the norm calls for in order to produce more and fulfill the output plan. Unless the norms are changed, the computer can only schedule the production of the lower number of goods. In almost all ASUPs, the vast majority of processing is not interactive, so that foreman would have no ability to make such a change without clearing it through the bureaucracy. There is no evidence to suggest that ASUPs have any ability to take into account other frequent "shocks" to the production process such as brown-outs; absenteeism, alcoholism, and shirking; and equipment breakdowns and the poor quality of maintenance services.³⁷

The second major function of the operational management subsystem is to collect accounting information. The accounting data that is collected is geared to show the movement of goods throughout the production process, unfinished production, and plan fulfillment.³⁸ The more data which is available on-line for cross-correlation, the harder it becomes for a manager to hide quasi-legal or illegal practices. For example, managers must pay workers even if there is no work to do because of supply shortages.³⁹ However, an integrated MRP system could easily leave an audit trail showing that undeserved wages were paid. This may explain why most of the reports which are generated are straightforward listings of basic quantities rather than analytical comparisons. These reports duplicate the output of the previous manual systems and therefore do not pose a great threat.

The absence of a lot of direct collection sensing devices, which could be viewed as a function of the failure of the instrument building industry, should also be viewed as a result of lack of demand. Both upper and lower level management have an incentive to "cook the books" if necessary in order to show plan fulfillment. The magnitude of this "simulation" is not often large, but it can be critical, for instance, when it is necessary to borrow output from next month to cover shortfalls this month.⁴⁰ Data collected directly from the shop floor will reveal the true state of affairs in the enterprise to any and all auditors.

C. ACCOUNTING

Accounting is one of the most widely implemented functions of the ASUP. In the 1970's, 40-50 percent of the calculations in ASUP

³⁶ Podval'niy, L. D., et al. "Normativnaya baza perspektivnogo planirovaniya," *Pribory i sistemy upravleniya* No. 9, Sept., 1984, 41-42; Rutland, Peter, "The Shchekino Method and the Struggle to Raise Labour Productivity in the Soviet Union," *Soviet Studies* v. XXXVI, 3, July, 1984, 345-365.

³⁷ Schroeder, Gertrude E., "The Slowdown in Soviet Industry, 1976-1982," *Soviet Economy* v. 1, 1, Jan.-Mar. 1985, 42-74; Tremi, Vladimir G., "Fatal Poisonings in the USSR," *Radio Liberty Research Bulletin* 490/82, Dec. 15, 1982, 1-12.

³⁸ Kruchinin, Pozadachnye otsenki, 1983.

³⁹ Feofanov, Yu., "Business Initiative and Legal Norms," *Izvestiya*, Jan. 24, 1985, 3, translated in *Current Digest of the Soviet Press*, v. XXXVII, 4, 1985, 5,9.

⁴⁰ Linz, *Managerial Autonomy*, 1986.

were devoted to it, and there is no indication that the balance has shifted in any significant respect since then.⁴¹

Enterprises can realize two important benefits from computerizing accounting operations. The first is eliminating hoardes of clerks operating abacuses and primitive data tabulation machinery. The second is a streamlining of the entire accounting operation, including the ability to put together timely new reports which improve managerial decision making. In the 1970's, neither of these goals were fully realized. Although some enterprises reported labor savings due to ASUP, others reported that procedures became more complicated and labor-consuming because of partial automation.⁴²

The traditional accounting system in enterprises consists of three different parts. Statistical accounting is geared towards reporting plan fulfillment data in accordance with requirements of the Central Statistical Administration (TsSU), the State Planning Committee (Gosplan), and the ministries. Bookkeeping accounting, or simply, bookkeeping, is oriented towards the needs of financial organs such as the USSR Ministry of Finance (Minfin). Both of these types of accounting fall under the control of the planning and economic departments and the main bookkeeping office. Operational accounting, such as the operations included in the production management and inventory subsystems, arose because neither statistical accounting nor bookkeeping could meet the expanding need for operational data that has been generated over the past two decades by growing enterprise autonomy, the increasing complexity of production, and the centralization of bookkeeping functions.

Although there was a debate about redesigning the entire accounting system to accommodate computing, and some enterprises did reorganize document flows,⁴³ the traditional accounting system remained intact. Despite the presence of the computer, statistical and bookkeeping accounting continued to produce the reports required by superiors while operational accounting was built into other functional subsystems. Analysis tasks, which might have integrated and reconciled these data, fell through the cracks.

Since the late 1970s, several initiatives have been made to improve the bookkeeping subsystem in ASUP and more generally, the accounting services available to enterprises. The All Union State Design Engineering Institute of the Central Statistical Administration (VGPTI) has been assigned the development of designs and software packages for enterprise accounting. The automation of accounting received a major push from a resolution of the USSR Council of Ministers "On measures for improving the organization of bookkeeping accounting and raising its role in the rational and economic use of material, labor and financial resources (Jan. 24, 1980.)" The resolution turned over the task of organizing programs to create a standard bookkeeping subsystem for enterprises to the State Committee on Science and Technology (GKNT), working with the TsSU, Minfin, and other organizations. This expanded program included the creation of a special guidelines document specifically

⁴¹ McHenry, *Absorption*, 1985.

⁴² Baltrushaytis, Yu., "EVM v roli bukhgaltera," *Ekonomicheskaya gazeta* No. 10, Mar., 1979, 6.

⁴³ Guneyev, G. S., et al. *Nauchno-tekhnicheskii uroven' avtomatizirovannykh sistem upravleniya ob'edineniyami i predpriyatiyami*, Statistika, Moscow, 1977.

for accounting (*ORMM-uchet*), due in the first quarter of 1983, and the completion of a number of software packages by the second quarter of 1985.⁴⁴

The *ORMM-uchet* guidelines, which were not approved until 1984, represent an attempt to impose orthodox accounting methods on enterprises from above. The fact that branch ministries and the TsSU are reportedly working on improving primary accounting forms in conjunction with the development of these designs and software will make them more palatable for enterprises.⁴⁵ In the past, the continued use of old forms negated many of the advantages of using the computer.⁴⁶ The new packages are supposed to include analysis tasks which encompass all of the economic activity of the enterprise. Interactive data entry and analysis are included for the first time.⁴⁷

The impact of the new designs and software is likely to be limited for a number of reasons. First, enterprises may be unwilling to adopt it if it entails major reorganizations and modifications of existing software. Second, the *ORMM-uchet* guidelines appear to be directed at the centralized parts of the bookkeeping system only. Discrepancies between operational and other forms of data may persist if old methods of data collection are continued. The use of keypunching and data entry from paper tape is still very widespread, leading to numerous errors.⁴⁸

Third, enterprises have a stake in maintaining some discrepancies in any case. A manual or partially automated system is more attractive because discrepancies are not discovered immediately, or are never discovered; calculations can only be done once; it is virtually impossible to respond to queries for non-standard types of information due to the labor intensity of calculations; inaccurate results can be blamed on the use of manual calculations; bookkeepers have direct access to records; and accounting can be done by functional departments and thereby remain under their control. Enterprises need to be able to conceal true production capacity, hoard stocks, pay overtime to workers during storming periods, etc. In earlier ASUPs, the fact that separate files were maintained for each subsystem allowed the enterprise to continue its practices relatively easily, while realizing gains based strictly on replacing labor. The *ORMM-uchet* programs would give enterprises far less control over their own accounting practices. New analysis tasks in these software packages might easily reveal falsification. An ASUP which used direct collection devices to continuously monitor all important parameters and included easily used analysis tasks to process all this data would leave an enterprise director naked before all

⁴⁴ Polkovskiy, L. M., "O dal'neyshem razvitii avtomatizatsii bukhgalterskogo ucheta," *Bukhgalterskiy uchet* No. 2, Feb., 1983, 11-13.

⁴⁵ Polkovskiy, L. M., "Unifikatsiya i tipizatsiya proyektnykh resheniy dlya mekhanizatsii i avtomatizatsii obrabotki dannykh dlya bukhgalterskogo ucheta," *Pravda*, Mar. 4, 1984, 2-5.

⁴⁶ Shenfield, Stephen D., Hanson, Philip, "The Functioning of the Soviet System of State Statistics (Findings from Interviews with Former Soviet Statistical Personnel)," Centre for Russian and East European Studies Special Report SR-86-1, July, 1986.

⁴⁷ McHenry, *Absorption*, 1985.

⁴⁸ For example, Blank, Ye. I., Shumilin, V. F., "Opyt podgotovki informatsii s ispol'zovaniyem ustroystv pogotovki dannykh na magnitnoy lente i displeyev," *Energetika i elektrifikatsiya. Seriya: sredstva i sistemy upravleniya v energetike* No. 8, Aug., 1984, 10-12.

his critics. Previous attempts to impose reform on enterprise management through computerization have more or less failed.⁴⁹

D. PLANNING

Besides accounting, the most frequent application encountered in ASUP is planning. About 40 percent of ASUP calculations are devoted to it, most of which fall under the category of technical-economic planning, or the creation of yearly plan targets in accordance with the figures handled down by the ministry. Savings from computerizing planning can come directly from replacing current procedures with automated ones and from using optimization.

In large Soviet enterprises, a tremendous amount of effort goes into creating yearly plans. For example, at the Moscow Electro-Mechanical Factory imeni Vladimir Il'ich, more than 8,000 documents in the yearly plan include about 400,000 lines and 4,000,000 data items.⁵⁰ It can take six months of effort from the enterprise planning-economic department to develop the plan. Added to inevitable inaccuracies due to the long lead times involved, the not infrequent changes in plans by the ministry rapidly cause the plan to become unbalanced.⁵¹ Its recalculation takes 3-4 months, which means that complete recalculations are more or less out of the question using manual methods.

Thus, the savings from computerizing planning come from: replacing manual labor, repeated use of constant data, ability to check consistency and calculate several options, and the ability to recalculate the plan in response to changing conditions. It is undoubtedly becoming harder and harder for Soviet enterprises to continue calculating the plan manually, if only because of the shortage of labor which will grow more acute during the next two decades. An important criticism leveled against the new normative net production indicator (which is replacing profits as a prime indicator of enterprise performance) is that it is much more difficult to calculate than previous indicators were. If the enterprise plan remains in its present form, some means of automating its calculation will become indispensable to most large Soviet enterprises.

Optimal planning has been one of the key concepts behind the widespread introduction of computers. Isolated reports in the press suggest that some enterprises have been able to reap large benefits from their use. The Barnaul Radio Factory was able to increase production by seven percent based on optimal planning.⁵² According to the head of the Central Economics and Mathematics Institute, N. Fedorenko, optimization models reduce unit costs 5-7 percent, capital expenditures 8-10 percent, and operating expenses six percent.⁵³

⁴⁹ McHenry, W. K., Goodman, S. E., "MIS in USSR Industrial Enterprises: The Limits of Reform from Above," *Communications of the ACM* v. 29, 11, Nov., 1986.

⁵⁰ Gordon, B.L., Iban'es-Fernandes, F., *Avtomatizatsiya raschyetov pri sostavlenii tekhpromfinplana mashinostroitel'nogo predpriyatiya*, Statistika, Moscow, 1978.

⁵¹ Dyker, Technical Progress, 1985.

⁵² Bobko, I.M., *Avtomatizirovannye sistemy upravleniya i ikh adaptatsiya*, Nauka, Novosibirsk, 1978, Krugliy stol, 1985b.

⁵³ Fedorenko, N.P., "Mathematical Economic Models and Methods: How Can Their Use be Improved and the Return from Automated Management Systems be Increased?," *Ekonomicheskaya Gazeta* No. 1, Jan., 1985, 14, translated in *Current Digest of the Soviet Press*, v. XXXVII, 6, 1985, 9.

Nevertheless, the percentage of optimization applications being solved in ASUP has remained quite low. Part of the problem is that optimization models have been developed in isolation from the other tasks, which meant that data had to be re-entered for their use.⁵⁴ But the main problems are environmental. If an enterprise runs an optimization model which is unconstrained by directive targets from above, it is likely to come up with a plan for which supplies will be unavailable. Enterprises have little incentive to produce close to maximum capacity.⁵⁵ The central planning process cannot be accomplished without "planning from the achieved level,"⁵⁶ which is likely to render unconstrained optimization irrelevant in any case.

Once the plan targets have been handed down from above, enterprises have a greater incentive to use optimization. However, targets are numerous. Very few models use more than one optimality criterion, and a feasible solution may not exist.⁵⁷ In the oil industry, for example, the ministry had to divide its targets among its enterprises even though none of the enterprises could actually fulfill them.⁵⁸ Models do not reflect the realities of the Soviet system:

The effectiveness of optimization calculations turned out to be significantly less than expected because designers have frequently underestimated the complexity of the economic mechanism in general, and the process of working out the plan, in particular. Putting together the plan is a creative act, in which an important role is played by difficult-to-formalize information; the mechanism of combining the requirements of optimality and reliability [safety] is not very clear; the practice of planning sharply differs from the official instructions, and one may therefore talk about two planning mechanisms—the real and the normative. In ASU everything is built according to the latter, and the results turn out to be inapplicable in practice.⁵⁹

Out of 22 models created for the construction industry only two had found practical use a decade later.⁶⁰ Many construction organizations wound up rejecting the use of models after finding them insufficient.⁶¹

The case of what happened to attempts to reduce metal content in pipes illustrates how economic realities interfere with optimization. The economic indicators of the enterprises worsened, Gosplan did not consider the plan to be acceptable, and even the consumers were not interested because the optimal plan did not reflect the necessary assortment mix. "In summary, it [turned] out that reducing the metal content [was] profitable only for the branch institute which proposed the methodology and [dragged] the planners and producers into a worthless affair which they [didn't] need."⁶²

⁵⁴ Fedorenko, *Mathematical Economic Models*, 1985; Mikhalevich, V. S., et al., "Ob ulushenii ispol'zovaniya optimizatsionnykh' raschetov v ASU Ukrainской SSR," *Mekhanizatsiya i avtomatizatsiya upravleniya* No. 4, Oct.-Dec., 1983, 1-5; Solodovnikov, F. I., "Avtomatizirovannye sistemy upravleniya: itogi i problemy," *Ekonomika i organizatsiya promyshlennogo proizvodstva* No. 3, Mar., 1979, 72-78.

⁵⁵ Fedorenko, *Mathematical Economic Models*, 1985.

⁵⁶ Birman, Igor, "From the Achieved Level," *Soviet Studies* v. XXX, 2, Apr., 1978, 153-172.

⁵⁷ "Kruglii stol redaktsii: problemy i perspektivy razvitiya avtomatizirovannykh sistem upravleniya (prodolzheniye)," *Ekonomika i matematicheskiye metody* v. XXI, 5, Sep.-Oct., 1985c, 920-934.

⁵⁸ Berezovskiy, *Opyt razrabotki*, 1982.

⁵⁹ Kruglii stol, 1985a, 551.

⁶⁰ Golub, L. G., "Matematicheskoe-ekonomicheskoye model—etapy zhizni," *Ekonomika i organizatsiya promyshlennogo proizvodstva*, No. 2, Feb., 1981, 105-113.

⁶¹ McHenry, *Absorption*, 1985.

⁶² Kruglii stol, 1985b, 752-753.

As optimization models become more flexible and permit suboptimal solutions which are consistent with Soviet conditions, enterprise managers will be more willing to use them. At the Ministry of the Fish Industry, higher officials permit trawler captains to choose plans which are a 3-4 percent improvement over traditional means, but another 7-8 worse than the optimal. "When the economic mechanism is improved, and the enterprise and the higher-up organization turn out to be interested in making decisions which are closer to the absolutely optimal, we will be ready for those changes, in as much as the technology of forming trip assignments already contains the corresponding optimization task."⁶³ The models that have had the most success have given enterprise directors the ability to minimize deviations from the plan. The involvement of high level managers is paramount for success.⁶⁴

III. THE ASUP PROGRAM UNDER GORBACHEV

A. TRENDS

Since the beginning of this decade, the ASUP program has given way to direct production computer applications such as robots, numerical control machine tools, and process control systems (ASUTP). At the end of 1985, according to official statistics, 4,651 ASUTPs had been built versus 3,672 ASUPs. The average yearly rate of introduction of ASUPs during the 11th Five-Year Plan was just 179, while the average rate for ASUTPs was 520.⁶⁵ Over 5,000 ASUTPs are scheduled to be installed during the 12th Five-Year Plan,⁶⁶ while the rate of introduction of ASUPs is likely to decline.⁶⁷

B. PROSPECTS FOR IMPROVEMENT

The Gorbachev package of reforms includes some measures which will directly affect the infrastructure support for computing, and others which may have a limited effect on how enterprises perceive computing. The former category includes the creation of a new State Committee for Computing and Informatics (GKVTI) and the creation of an interbranch scientific technical complex (MNTK) for personal computers.

According to the chairman, N. Gorshkov, the newly formed GKVTI intends to oversee all of the computer centers in the country and to be heavily involved with all aspects of planning and supplying computer equipment. The regional network of GKVTI production associations will provide services for computer users and will serve as a means to collect comprehensive information about how computers are used and what is needed where.⁶⁸ Services will include hardware repair, software development, training, and maintenance of software libraries.⁶⁹ The GKVTI will head a new

⁶³ Krugliy stol, 1985b, 749.

⁶⁴ Krugliy stol, 1985b.

⁶⁵ Narkhoz, 1986.

⁶⁶ *Pravda*, Mar. 4, 1986.

⁶⁷ Krugliy stol, 1985b.

⁶⁸ Denisov, *Effektivneye*, 1986.

⁶⁹ Miheyev, *Industriya informatiki* 1986.

center for Informatics and Electronics, which may be the lead organization of an Interbranch Scientific-Technical Complex (MNTK).⁷⁰ A state inspectorate under the committee is being created to improve the hardware design and engineering process. Gorshkov foresees a time when the GKVTI will also oversee the collective-use computer centers of the TsSU, will provide software engineering environments through the regional organization, will be responsible for all computer-related education, and will organize rental of machines so that users pay only when the machine is working.⁷¹ A resolution passed by the Central Committee and Council of Ministers gives GKVTI the ability to make binding policy in its areas of authority.⁷²

So far the MNTK for personal computers is receiving almost no support from the computer-producing ministries, who consider it to be a passing fad. Four different ministries are producing their own personal computers already.⁷³ Each participating organization in an MNTK is still funded by its own ministry, leading to problems of coordinating their overall work.⁷⁴

It is more difficult to track the evolution of those reforms which will affect the enterprise environment, and consequently influence the way that enterprise managers perceive computing. Few of the measures will affect the fundamental incentives discussed in section II of this paper. Philip Hanson has described a planned switch to wholesale goods under the control of the State Committee for Material-Technical Supply (Gossnab).⁷⁵ Even if this reform is fully implemented, which is doubtful given the record on wholesale supplies from the 1965 reforms, late supplies are more a function of taut planning and the transportation system than who controls their distribution. Unless Gossnab can significantly reduce supply delays, this measure is likely to have little effect on ASUP.

A second set of measures is designed to reduce ministry interference in enterprise affairs. The shift to superministries, larger groupings for enterprises, and the elimination of all-union production associations are intended to promote autonomy by severely limiting the extent to which central bureaucrats can oversee their enterprises.⁷⁶ Perhaps in conjunction with this, the TsSU has recently announced that enterprises will have to provide 50 percent less information to state organs.⁷⁷ A provision for stable Five-Year Plan targets, which has been on the books since 1971, would allow enterprise to get away from the influence of planning from the achieved level.

If enterprise directors are convinced that there will be less direct oversight, they may be more willing to use optimization routines and do more analysis with the computer. However, most ministries

⁷⁰ Denisov, *Effektivneye*, 1986: "The USSR This Week: Politburo Meeting," *Radio Liberty Research Bulletin* 208/86, May 23, 1986, 8.

⁷¹ Mikheyev, *Industriya informatiki* 1986.

⁷² *Izvestiya*, Apr. 22, 1986, 3.

⁷³ *Izvestiya*, July 11, 1986.

⁷⁴ *Izvestiya*, June 30, 1986, 2.

⁷⁵ Hanson, Philip, "What is Gorbachev Up To? Puzzles of Soviet Reform Policies," Presentation at the Center for Strategic International Studies, Washington, D.C., Nov. 13, 1986.

⁷⁶ Hanson, *Puzzles*, 1986.

⁷⁷ "The USSR This Week: Politburo Meeting," *Radio Liberty Research Bulletin* 208/86, May 23, 1986, 8.

have so far remained intact, and it seems unlikely that they will be dismantled in the near future. Ministries collect considerable amounts of data from enterprises in spite of TsSU regulations to the contrary.⁷⁸ There is no indication that the *ORMM-uchet* program, which could lead to less enterprise autonomy, is being dismantled. Only Minpribor has so far eliminated production associations. Philip Hanson is extremely skeptical about the prospects for stable plans; they would have to contain considerable slack, which is certainly not the case for the 12th Five-Year Plan. Gorbachev's initial campaign for discipline, which was "gleefully" taken up by the bureaucrats, may lead to greater interference.⁷⁹

Another set of measures will allow a select group of enterprises to begin engaging in direct foreign trade.⁸⁰ The lure of foreign markets and hard currency may increase incentives for more sophisticated computer usage, although these enterprises are still subjected to the same economic incentive system at home.

It is well-known that Mikhail Gorbachev is banking on technology to implement his intensive growth strategy. The creation of the GKVTI will inevitably lead to improvements in the computing infrastructure, if only because of the increased priority its existence represents. However, computerizing enterprise management is risky for managers not only because of inadequate computer services, but also because it threatens some of the fundamental ways that the enterprise does business under Soviet conditions. In principle, the combination of centrally controlled wholesale trade, stable five-year plans and greater enterprise autonomy might work together to provide a better atmosphere for ASUPs. In practice, the ASUP program is likely to continue to languish. Instead of going to the trouble of implementing ASUPs, enterprises will receive limited data processing services from centrally controlled branch or TsSU computer centers. ASUPs will experience a resurgence only when suitable data processing environments have been built from the bottom up through industrial automation.

⁷⁸ Shenfield and Hanson, State Statistics, 1986.

⁷⁹ Hanson, Puzzles, 1986.

⁸⁰ Hanson, Puzzles, 1986.

THE COMPUTER LITERACY PROGRAM: PROBLEMS AND PROSPECTS

By Peter B. Nyren*

CONTENTS

	Page
I. Summary.....	200
II. Soviet Objectives.....	201
Structure of the Program.....	202
Soviet Motivations.....	204
III. Soviet Industrial Deficiencies.....	204
IV. Acquiring Western Computers.....	206
V. Domestic Opposition.....	207
VI. Outlook.....	208

I. SUMMARY

As part of an overall plan to speed up the rate of scientific-technical progress, the Politburo has endorsed a program to introduce as many as 5 million personal computers (PCs) into secondary and vocational-technical schools over the next 15 years, both to enhance basic understanding of computer technology and its applications and to aid in the teaching of other subjects. Technical and political problems promise to frustrate the program's implementation during the first several years, but, if these roadblocks can be overcome, the program will provide some significant long-term benefits in industrial development and modernization.

On the political side, the increased use of PCs is a potentially serious threat to party control. Equipped with word-processing software and a printer, a PC could revolutionize the *samizdat* (Soviet underground publication) process. Moreover, PCs provide plant managers with a sophisticated tool that could be used to challenge production quotas and supply figures set by the State Planning Committee and the ministries.

Implementation of the literacy program is being slowed by opposition from officials who view the widespread use of PCs as a threat to the traditional state monopoly of information in the USSR. There is still a significant pocket of resistance that favors the collective departmental method of computing, which relies on large mainframe machines and allows computer use to be more easily controlled.

The most serious obstacle facing the schools is the shortage of equipment. The Soviets' own PC will be manufactured in small quantities for at least the next few years and probably will continue to have reliability problems. A deal for a Western-built turnkey

* Office of Soviet Analysis, Central Intelligence Agency.

computer plant would be the quickest way for the Soviets to get a reliable PC in series production. COCOM restrictions pose a major obstacle, however. Importing large numbers of PCs may be the best short-term option, but shortages of hard currency and the fear that relying on imports might stifle development of domestic computer production will limit Soviet purchases of Western equipment.

The long leadtimes that have been factored into the computer literacy program are indicative of the difficulties facing the USSR in its campaign. The first—or “preparatory”—stage is to take place during the current 12th Five-Year Plan (1986–1990), but the main part of the program is not scheduled to be implemented until the 13th and 14th Five-Year Plans (1991–2000). This extremely slow developing program reflects the current state of affairs in Soviet computing:

- Computer hardware developments lag those in the West by an estimated four to 10 years, depending on the type of hardware.
- The software industry has virtually no experience in developing software for PC applications.
- The computer industry has not been able to produce reliable equipment in significant numbers.
- Computer users are consistently frustrated by poor-to-non-existent technical service and the lack of spare parts for their computers.
- Industrial managers have few incentives to take the risks associated with incorporating new technologies at the plant level.

Despite these obstacles, which will certainly postpone the payoffs of using computers in the classroom, the literacy program should benefit Soviet automation efforts in the 1990s by:

- Providing the computer industry with a large domestic market for PCs and supporting equipment. This should stimulate technical and industrial development as the industry reaps the benefits of larger-scale production and increased funding for R&D.
- Helping to alleviate the critical shortage of computer programmers both by beefing up training programs in technical schools and by creating more interest in computers among students.
- Breaking down resistance to computer use caused by “computer phobia” and ignorance of the potential of PCs in industry.

The Soviets are aware that these benefits will not be realized for some time and that the literacy program will not, by itself, make enterprises run more efficiently. Despite the expected delays, the leadership sees the program as an important component of Moscow’s overall effort to foster intensive economic growth through the increased use of computers and automated systems.

II. SOVIET OBJECTIVES

In January 1985, the Politburo approved a statewide program for the development, production, and effective use of computer technology and automated systems up to the year 2000. The goal of this program is to reequip the national economy of the USSR on the

basis of computer technology and microelectronics, thereby increasing labor productivity, raising product quality, and improving management and decisionmaking. Computer-based planning and design and automated production are to provide the foundation for a resurgence in machine building and a reconstruction of the national economy as a whole. Advanced technologies will be the decisive factors for improving the productivity and quality of production of all industries.

The CPSU Central Committee and the USSR Council of Ministers also passed a resolution¹ in early 1985 to foster widespread applications of computers in Soviet education. While envisioning improvements in the teaching process for many subjects, the resolution is targeted mainly at familiarizing students with computer technology, programming, and applications—thereby supporting the modernization program. The approach calls for “teaching students practical computer skills and equipping them with knowledge about the broad use of computers in the national economy.”

No secret is made of the ultimate goal of the computer literacy program. It is to equip Soviet students with the skills and knowledge of computers that will make them productive workers in the new information age, an age in which microprocessors, computers, and other information processing devices are to be commonplace on the shop floor and in the research lab. A 1985 newspaper article gives us an idea of the role the Soviets envision for the personal computer:

The computer will become the personal tool of an ever greater number of people: engineers, designers, dispatchers, librarians, cashiers, operators of program-controlled machine tools, production controllers, and workers in dozens of other professions.²

To cope successfully in the information age, the future Soviet worker must feel at ease with and be able to use a wide range of devices containing imbedded microprocessors. That implies a level of technical familiarity with computer components and functions beyond that encompassed by the usual American understanding of computer literacy, which focuses on being able to use a computer without necessarily being able to program it. The Soviet leadership does not envision an information age predominantly defined by the personal use of word processing and electronic mail. Its vision is one of widespread use of robots and the professional use of desk-top computers by designers, project planners, engineers, researchers, and technologists.

STRUCTURE OF THE PROGRAM

The literacy program is to be implemented on two levels, according to a 1985 Soviet newspaper article by corresponding member of the Academy of Sciences Andrey Yershov.³ (Yershov heads a department of the computer center at the Academy's Siberian branch and is in charge of a group of projects on computerization and the

¹ On Further Improvements in General Secondary Education for Young People and Better Operation of General Education Schools.”

² Yershov, Andrey, “What is Information Science,” *Uchitel'skaya gazeta*, 5 March 1985, p. 2.

³ Yershov, Andrey, “General Computer Education,” *Uchitel'skaya gazeta*, 11 September 1984, p. 2.

introduction of personal computers in secondary schools.) The first level of instruction, which was introduced in September 1985, consists of a general introduction to the basic principles of computers and computer programming. Instruction at this level consists of a mandatory course entitled "Fundamentals of Information Science and Computer Technology," which is to be offered in every Soviet secondary school.⁴ The course, referred to by the Soviets as *Informatika IX-X* (see table 1), is being introduced in the ninth and tenth grades and is expected to occupy about 102 hours of teaching time (40-50 percent of which is to be spent on the computer). Eventually the program is to be expanded to include grades 7 and 8, although this is not expected to be implemented until the middle 1990s (see table 2).

TABLE 1.—*High school course curriculum (102 hours)*

[9th and 10th grades]

Introduction (2 hours).
How to Get Started (5 hours).
Algorithmization (28 hours).
Algorithmic Notation
How to Find an Algorithm
Computer Architecture (12 hours).
Programming (21 hours).
Problem Solving with a Computer (29 hours).
How to Use Applications Software:
Text processing.
Graphics.
Databases.
Spread sheets.
Application packages.
Computer History and Computers in Society (5 hours).

The second level of instruction, which will be implemented during the later phase of the program as more PCs are installed in the classrooms, involves the use of computers as a teaching aid in the study of other subjects. The implementation of this level will be seriously hampered by the lack of the specially-designed, Russian-language software needed for computer-aided instruction and the acute shortage of adequately trained teachers.

TABLE 2.—PROJECTED TIMETABLE FOR SCHOOL COMPUTERIZATION

[Goal: 60,000 schools, 4 million students in each grade, each computer class with 12-15 networked computers]

	1985 (fact)	1990 (plan)	Estimated—	
			1995	2000
Number of computers	1,000	500,000	2,000,000	5,000,000
Course schedule:				
Informatics IX-X				
Informatics VII-VIII				
Working with computers ¹				

¹ According to Yersnov, most schools will be using the "computerless" version of the course until at least the early 1990s.

In vocational-technical schools, new specialties are being introduced covering the use, design, and production of computer tech-

⁴ Schools which are not equipped with computers (the vast majority in the early years of the program) are offering a "computerless" version designed to give the student a chance to master the theoretical and cognitive aspects of the course.

nology. According to Yershov, these schools should turn out at least 200,000 computer specialists a year. In addition, students who have gone through the second-level program in a secondary school will be eligible to enroll in a technical school, or *tekhnikum*, for advanced training as systems and applications programmers.

SOVIET MOTIVATIONS

Soviet interest in computerization appears to stem from the concern that the USSR is forgoing many of the educational, industrial, and scientific advantages that are apparent in the Western "computer revolution." The literacy program will contribute to the computerization effort by fostering a greater acceptance and general knowledge of computers and their uses. It should also help alleviate the serious shortage of skilled programmers and computer users by creating a pool of people that can more readily benefit from advanced training and by identifying talented students for accelerated teaching programs. Former USSR Academy of Sciences President Anatoliy Aleksandrov, one of the first to call for a literacy program, has described the achievement of computer literacy as important as the drive to eliminate basic illiteracy after the revolution.⁵ Aleksandrov publicly lamented that the Soviet Union fails to make efficient use of even the small number of domestically produced computers because of a shortage of trained personnel and inadequate awareness among middle- and top-level Soviet managers of the potential of computers. Concern over the primitive state of PC awareness in the USSR increasingly has become a subject of public discussion.

Not all Soviet scientists are so enthusiastic about the increased use of personal computers. The director of the Academy's Institute of Automation and Electrometry, Yuriy Nesterikhin, said in a 1985 newspaper article that the Soviets must approach the use of PCs carefully because they are a "borrowed idea" and "must be translated to our language and correlated with our conditions."⁶ Nesterikhin favors the idea of the collective "departmental" method of using computers, relying on large mainframe computers that are more easily controlled.

III. SOVIET INDUSTRIAL DEFICIENCIES

The biggest obstacle to the implementation of the computer literacy program is supplying and maintaining the necessary computer equipment. According to Academician Yershov, more than 50,000 computer labs equipped with 1 million PCs will be needed to fully implement the preparatory level of the program.⁷ This is not expected to happen until the early 1990s at the earliest. To give an indication of the immensity of the task, the Soviet press reported that the domestic computer industry was scheduled to deliver about 1,300 PCs to schools and that 200 classrooms equipped with foreign-made computers for ninth-grade students were scheduled to

⁵ "The Horizons of Electronics," *Izvestiya*, 1 December 1984, p. 1.

⁶ "The Energy of Novelty," *Literaturnaya gazeta*, 21 August 1985, p. 10.

⁷ Yershov, Andrey, "Computers in the Classroom," *Pravda*, 6 February 1985, p. 3.

open during the 1985 school year.⁸ Yershov has indicated that the Soviets plan to equip each school with a single module of 12 to 15 computers. According to this scenario, approximately 280 schools (or less than 1 percent of all secondary schools in the USSR) had their own computers during the 1985-86 school year.

The Soviets have only recently recognized the importance of personal computers and are therefore way behind the West in their development. The Soviet have only recently called for the series production of PCs (to start sometime during the 12th Five Year Plan) with the goal of manufacturing 1.1 million by 1990. The primary Soviet-produced personal computer—the Agat, a copy of the Apple II—has been plagued with performance and production problems and is unlikely to meet the needs of the computer literacy program, either quantitatively or qualitatively, for at least the first phase. A US computer expert who operated the Agat, described the inside as a “nightmarish wiring maze,” indicating that the printed circuit boards and other components had been connected by obsolete and unreliable point-to-point hard-wire methods. The construction technique is prohibitively labor intensive and not readily adaptable to mass production.⁹

The Soviets are also developing at least two PC models primarily for application in schools. One is an eight-bit model compatible with the IBM PC and the other is a 16-bit computer based on Digital Equipment Corporation's PDP architecture. The designators of these two machines are not known yet. The likelihood that these PCs would be available in significant numbers for the literacy program in the near future is remote.

There has been a spate of Soviet press releases during the past year announcing other new personal computers being developed primarily for application in schools. This is causing some concern among officials involved with the literacy program over the need for standardization. According to Boris Naumov, Director of the USSR Academy of Sciences Institute of Information Technology, PC production goals are being threatened by a lack of standardization where “each development engineer is making his own machine” and “as a result, there are now several types of personal computers being produced or put into production.”¹⁰

Yevgeniy P. Velikhov, vice president of the USSR Academy of Sciences and head of the Academy's recently formed Department of Information Science, Computer Technology, and Automation, stated in a 1984 journal article that the Soviet Union produces only “dozens” of PCs per year.¹¹ In addition, a 1984 article in a Soviet newspaper pointed out that the Soviet computer industry meets only 5 percent of its small computer needs.¹² Yershov provided some more optimistic figures when he stated that more than 1,300 Agat personal computers were scheduled to be delivered to Soviet

⁸ Yershov, Andrey, “General Computer Education,” *Uchitel'skaya gazeta*, 11 September 1984, p. 2, and “The Computer is Coming to School,” *Trud*, 30 July 1985, p. 2.

⁹ Bores, L.D., “Agat, a Soviet Apple II Computer,” in *Byte*, November 1984, pp. 135-6, 486-90.

¹⁰ Naumov, Boris, “Personal Computers at the Starting Line,” *Izvestiya*, 11 July 1986, p. 2.

¹¹ Velikhov, Yevgeniy, “Personal Computers—Today's Practice and Prospects,” *Vestnik Akademii Nauk SSSR*, No. 8, 1984, pp. 3-9.

¹² Georgiyev, G. and Ye. Vikent'ev, “The Subservient Computer,” *Sovetskaya Rossiya*, 31 August 1984, p. 3.

schools during 1985.¹³ Even this number is dwarfed in the West by IBM alone, which sold 1.5 million of its PCs and PC Jrs in 1984.

The Soviet computer industry also has been unable to provide its customers with adequate maintenance support. An unusually candid article in *Leningradskaya pravda* reported on the problems Leningrad organizations (and probably like enterprises throughout the USSR) are encountering in their drive toward computerization.¹⁴ Problems cited included a lack of spare parts, shortage of trained personnel, and an incentive system that actually encourages shoddy repairs. Boris Naumov, who heads the Soviet institute responsible for purchasing foreign-made PCs for the literacy program, admitted that servicing computers is currently beyond the power of most schools. Naumov said allocation decisions in the early stages of the program will be based on the ability of the schools to provide maintenance for the PCs.¹⁵

IV. ACQUIRING WESTERN COMPUTERS

The most attractive vehicle for meeting long-term program objectives, while simultaneously improving domestic production capabilities, is the purchase of a Western-built turnkey computer plant. Such a plant could be operational within two to three years of a signed agreement and would prove an effective mechanism to transfer Western production technology and know-how. The Soviets have talked with several Western companies about building a PC plant in the USSR. A British journal reported that, during Gorbachev's visit to England in December 1985, Soviet officials met with representatives of a British computer firm to discuss the construction of a turnkey PC plant that could cost up to a reported \$100 million.¹⁶ The feasibility of a turnkey plant purchase is questionable, however; the US Government has embargoed the sale of computer plants to the USSR since 1979, and COCOM requires the unanimous approval of all member nations.

To satisfy the immediate need for computers, the USSR, spurred by recently relaxed COCOM trade controls on certain PCs,¹⁷ entered into negotiations with several Western and Japanese firms to buy PCs and related equipment. In March 1985, representatives of a Soviet trade organization initiated discussions on the possibility of buying a large number of Apple IIe and IIc personal computers. Soviet officials have also contacted computer firms in other Western countries, setting off intense competition. In July 1985, several press reports announced that a Japanese trading company had outbid 26 computer firms from around the world to win a contract to export 4,000 eight-bit personal computers and an undisclosed number of printers to the USSR.¹⁸ This is the first known contract

¹³ Yershov, *Uchitel'skaya gazeta*, op cit.

¹⁴ Tveritina, V. and V. Chichin, "Electronic Service," *Leningradskaya pravda* 22 May 1985, p. 2. See also, *Izvestiya*, 9 July 1985.

¹⁵ "The Computer is Coming to School," *Trud*, 30 July 1985, p. 2.

¹⁶ *East European Markets*, Vol. 5, No. 3, 4 February 1985, p. 12.

¹⁷ Under new rules set by COCOM, Western companies are allowed to sell low-powered, eight-bit microcomputers to the Soviets without a license. These machines process data eight bits at a time, rather than 16- or 32-bit rates of more powerful business computers. They have fairly small memories and would be sold in the West for \$100 to \$500 each as home computers. Sales of more sophisticated PCs remain tightly controlled.

¹⁸ *Summary of World Broadcasts*, The USSR, Weekly Economic Report, SU/W1350, 2 August 1985, p. A/1.

that the Soviets have signed with a Western or Japanese firm for the purchase of PCs.

Despite the approaches being made to Western computer firms, the USSR will probably limit annual PC purchases to 4,000 to 5,000 machines over the next couple of years to fill the gap while domestic producers are gearing up their own manufacturing capabilities. The scale of imports will be limited by shortages of hard currency, the problem of providing service and spare parts for the PCs, and the desire to develop a domestic PC production capability as quickly as possible.

V. DOMESTIC OPPOSITION

A nationwide computer literacy program and the widespread use of personal computers in general are issues that have engendered strong criticism in the Soviet Union from several sources. Party and police officials perceive widespread use of computers as a threat to the traditional state monopoly of information to the USSR. In a society which tightly controls access to duplicating equipment, the prospect of millions of personal computers—each a potential printing press when coupled with a printer and word-processing software—alarms the political leadership. PCs could revolutionize the *samizdat* process. Floppy disks and cassette tapes would expedite the person-to-person transfer of information. Inter-computer electronic communication, while probably subject to state monitoring and control, could threaten the regime's control of information. Aside from the subversive threat, widespread use of PCs for transmitting data over computer networks or as a means of remote access to state data bases could increase the prospects of compromising state secrets or leaking embarrassing information, which the state now routinely suppresses.

Additional opposition comes from officials who fear the social consequences of computerization. These concerns have been raised with increasing frequency as the pros and cons of computerization have become a subject of discussion in Soviet academic journals. A series of articles in the scientific and theoretical journal of the USSR Academy of Sciences reviewed studies of the computerization experience in the West.¹⁹ These articles point out that some of the undesirable social effects of computerization might occur in the USSR. The formation of "utilitarian, rational" values, which would undermine the official ideology, and greater social inequality are a couple of the key concerns raised in these discussions. Some authors remind their readers of computer-created unemployment in the West and warn that computerization may entail significant costs to those segments of society least able to meet the demands of the computer revolution.²⁰

Party ideologists are naturally among those most concerned with the social and political implications of computerization. The party journal *Kommunist* warned against the "computer fetishism" dem-

¹⁹ See for example, "Information and Contemporary Global Problems," *Voprosy filosofii*, No. 12, December 1983, pp. 95-106, and "The Cul-de-Sacs of the Information Society," *Mirovaya ekonomika i mezhdunarodnyye otnosheniya*, No. 4, April 1984.

²⁰ Vydrin, D., "The Romance of Capitalism With the Computer: American Propaganda in Search of an Electronic Wonder-Worker," *Rabochaya gazeta*, 2 June 1985, p. 3.

onstrated by officials who advocate computerization "at any price" and who see universal introduction of computers as a cure-all for economic and organizational problems.²¹ A candidate of philosophy, whose articles have appeared in both *Kommunist* and the journal of the Academy of Sciences, has pointed out the need to understand clearly the dangers inherent in uncontrolled and unlimited computer application.²² He criticized the work of the Academy of Sciences and the State Committee for Science and Technology for focusing on the scientific and technical problems of computerization while ignoring or neglecting social and political problems.

VI. OUTLOOK

Although the payoffs are not likely to be realized until the 1990s, the computer literacy program is regarded by the leadership as an important component of Gorbachev's plan to revive the economy through "intensive" growth in productivity. The program will augment industrial modernization efforts by spurring industrial demand for domestic PCs, increasing the supply of computer programmers, and eroding some of the resistance to computer use, mainly at the plant level. The seriousness of the obstacles and the backwardness of the Soviet PC industry, however, have led the Soviet leadership to take—by Western standards—an extremely cautious course that will effectively delay widespread realization of these benefits until at least the early to middle 1990s.

The ultimate success, both of the literacy program and of the computerization effort in general, will depend on the Soviets' ability to manufacture and service at least hundreds of thousands of reliable PCs and to overcome user resistance at the enterprise level. Upgrading the performance of the computer industry will require significant Western assistance, at least in the short term, in the form of a turnkey plant or the direct sale of computers and related equipment.

The pace and success of the program also will depend on the willingness of the leadership to take the political risks entailed. A cautious approach, with tight controls on the provision and use of PCs, will impede familiarization with computer technology and stifle innovative applications. On the other hand, loose controls could lead to unauthorized use and possibly precipitate a social backlash.

Extension of the literacy program to include the teaching of other subjects by computer will be delayed by the need to develop Russian-language educational software. The software, in most cases, will have to be internally developed because of the general shortage of quality software of this type, even in the West, and because of Russian-language requirements. In view of the limited capabilities of the Soviet software industry, the development of course software, needed in the second phase of the literacy program, will be a problem area for some time.

²¹ "The Scientific-Technical Revolution and its Social Aspects," *Kommunist*, No. 12, 1982, pp. 13-24.

²² Smolyan, G.L., "The Computer and Man," *Kommunist*, No. 1, 1985, pp. 105-06, and "Socio-Philosophical Problems in the Development of Computer Technology," *Voprosy filosofii*, 11 November 1984, pp. 69-78.

COMMENTARY

By Hans Heymann, Jr.*

This commentary draws on work done in connection with a Hudson Institute study sponsored in part by the National Council for Soviet and East European Research. The author is pleased to acknowledge his indebtedness to Robert W. Campbell of Indiana University, with whom he collaborated in the telecommunications aspects of that study. A progress report on that study is contained in a Hudson Institute Draft Paper (Richard W. Judy, Robert W. Campbell and Hans Heymann, Jr., *Soviet Informatics Project Phase I Draft Report*, HI-3884-DP, February 12, 1987; see especially Section 3, "The Infrastructure—Telecommunications").

MAGNITUDE AND SIGNIFICANCE OF THE TELECOMS LAG

It is interesting but not altogether surprising to find that none of the four papers in this section that deal with aspects of the Soviet computer environment makes more than passing reference to telecommunications as a key factor in the emergence of the "information society". The fact is that, in spite of the existence of a substantial body of Soviet literature, relatively little research has been done on this subject. Perhaps this is so because the intimate linkage between computers and telecommunications is not all that widely appreciated, and the issues in telecommunications are technically quite complex and not all that easily unravelled.

The theme of this note is that the marriage of computers and telecoms that has taken place in the West—and most rapidly in the US—is bringing about revolutionary changes in the way all manner of social and economic activity is conducted in the industrial West; that the backwardness of the Soviet telecoms infrastructure has held back a comparable development in that society; and that a comparison between the US and Soviet telecoms environments strongly suggests that a communications-intensive information society is not a likely prospect for the Soviet Union in the foreseeable future.

TELECOMS IMPACT IN THE WEST

Telecommunications, which was for decades one of the most stable and plannable of Western industries, has been pushed by technology, economics and regulatory turmoil into a computer-like state of perpetual market-driven change. Telecoms—which is itself the product of the computer revolution—now finds itself in heated competition with its technological twin, the computer industry (both are based on microchips, both run on computer programs).

* Distinguished Professor of Political Economy, Defense Intelligence College.

Suddenly, communications networks in the West are bursting with productivity-raising possibilities that any number of profit-seekers are eager to pursue. In the US, the divestiture of AT&T three years ago has opened the market to hundreds of new vendors pushing a wide variety of new products and services. At the same time, the highly-developed networks that link voice terminals, and the less developed ones that interconnect data terminals are in the process of merging. The functions of processing information and transmitting it have become inextricably intertwined—and this intertwining is pushing the industry rapidly toward the integration of communications services into a single, eventually all-digital, network.

The pressure to move toward network integration is intensified by the great variety of value added or "enhanced" network services that are rapidly coming on stream. These include a variety of enhanced telephony features, home telemetry functions and, perhaps most important, telecoms "transport" functions that offer improved data transmission services (speed, capacity, economy and connectivity) as well as comprehensive access to hundreds of on-line data bases and remote data processing, electronic mailbox and financial services that are delivered over the public and private networks by third party providers.

The leading players in this new market—Telenet, Tymnet, Uninet, IBM, GEISCO, CompuServe and many others—have an increasingly global reach. The Telenet network, for example, extends to more than 50 countries and can be accessed by a local phone call from more than 300 US cities. Its standard offerings include packet-switched data communications, remote computing, electronic mail service, electronic funds transfer, remote order entry, voice messaging service, point of sale transaction processing and credit card authorization. But new service enhancements are constantly being added, including international document delivery, computer software distribution, centralized network management for hybrid (mixed private/public) networks, and public satellite service (as an alternative to leased-line data communications). Increasingly, the offerings are being extended to include specialized network-based services to vertical markets, such as health care, financial services and manufacturing sectors, where sophisticated applications can be targeted at specific market niches.

Clearly, many of these enhanced services are idiosyncratic of the Western market environment and have few counterparts in, and little relevance to, contemporary Soviet society. Indeed, it might be argued that even in the West the commercial viability of some of these enhanced services is by no means assured. Certainly the marketplace is still highly fluid, and many users remain ambivalent about the utility and cost-effectiveness of some of the novel offerings. But this has not deterred a horde of risk-taking service providers from experimenting, though many of them operate for years in the red. No doubt there will be much shaking out, spinning off and buying up in the marketplace, many new entrants and some consolidation. But in time entirely new industries will be created, with clearly far-reaching implications for the kind of "information society" that is increasingly taking root in the West.

THE SOVIET TELECOMS LAG

There is virtually no echo of this dynamic Western trend in the Soviet Union, and the archaic condition of the Soviet telecoms sector bears a good share of the responsibility for this state of affairs. By any standard, the Soviet telecoms sector is backward and inadequate—not only in comparison with its Western counterparts, but also in relation to the needs of its own society. It is technologically antiquated and inefficient, and its switched networks are too thin even to tie the economy and the country together, to say nothing of permitting the kinds of “informatics” development that are sweeping the West. A few comparisons with the US telecoms sector will illustrate the point:

SOME SUGGESTIVE TELEPHONY COMPARISONS (EARLY 1980s)¹

	US	USSR
Number of telephones (millions):		
Installed	NA	35.9
Connected to public net	180	29
Percent residential	84	54
Number of intercity calls (billions)	45	1.7
International calls originated (millions)	310.8	2.13

¹ Based on data from International Telecommunications Union [ITU], “Yearbook of Common Carrier Telecommunications Statistics.”
NA: Not available.

As might be expected, given the leadership’s long-standing priorities, government needs are better served than those of the population, and urban households are far less disadvantaged than their rural counterparts. But all suffer long delays in getting telephones installed, with more households on the waiting list than the number of telephones already installed. In Campbell’s judgment the telecoms infrastructure is a bottleneck, both in relation to household desires and in relation to the communication needs of the state sector.¹

As a result of a growing recognition by the Soviet leaders of the seriousness of their telecoms deficiencies, an important turning point in Soviet policy came in the form of a series of decisions in 1984–85, giving much higher priority to modernizing the telecoms system. The measures to be taken include a sharp expansion in the capacity of exchanges, moving forward technologically to stored program control and toward digitization, and wider use of comsats and fiber-optic transmission. The Soviet leaders have now clearly come to realize the crucial role of telecoms to the information revolution and have begun the long trek towards an integrated digital network. But there is a real question as to how well the Soviet telecoms industry is structured to move briskly towards a modern system. The issue, more specifically, is whether the highly centralized Ministry of Communication (Minsviaz’), which is the lead institution responsible for all non-military point-to-point switched com-

¹ For a more extensive assessment of the state of Soviet telecoms, see Robert W. Campbell, “Current Party Plans for Developing Telecommunications,” presentation at the IREX/USIA Conference on Communications and Control in the USSR, Washington, DC, September 17, 1986.

munications functions in the country, has the capability, dexterity and clout to manage the ambitious Soviet modernization effort.

IS "THE OLD MA BELL" A RELEVANT MODEL?

Some knowledgeable Western observers of the Soviet telecoms scene have argued that Minsviaz' is the kind of centralized, monopolistic institution that is patterned after the old Ma Bell in the US, and that it should work well for the Soviet leaders, given their highly focused objectives and rather narrow priorities.²

A closer look at "the old Ma Bell", however, suggests that this supposition may be both a misreading of the origins, evolution and peculiar nature of AT&T, and a misjudgment of the kind of institution best capable of coping with the complexities and uncertainties of the telecoms environment and telecoms issues that now face both the US and USSR. The image of an "old Ma Bell" model of uncontested control over a highly centralized, unified telecoms system developed in accord with a clear and consistent strategy bears little resemblance to the decision processes that have actually evolved in the US and, indeed, may have little relevance to the tasks now facing the Soviet telecoms sector.

WAS "THE OLD MA BELL" A CLASSIC MONOPOLY?

A quick look at some often-ignored aspects of AT&T's unique evolutionary history may help remind us that the Bell System, far from having been a comfortably protected monopoly, developed in a highly competitive environment in its formative years; was subjected, as a regulated monopoly, to persistent threats to its control of the telephone system by a succession of massive antitrust inquiries and litigations; and was finally returned to the hot embrace of competition through a series of FCC, Justice Department and court decisions spanning the period 1968 through 1982. A few observations about this experience may help put the comparison in clearer perspective:

THE COMPETITIVE PHASE

Formed in 1877, the Bell Telephone Company moved quickly to put itself in firm control of the telephone business by licensing numerous local operating companies with whom it entered into permanent relationships, and by establishing Western Electric as its exclusive manufacturing arm. But when its basic patents expired in 1894, Bell found itself suddenly faced with a competitive encroachment of numerous newly formed independent telephone systems (87 in that year alone), filling a rapidly expanding demand that Bell and its associated operating companies could not fully meet. Despite a vigorous defensive expansion by the Bell System, financed mostly by public stock offerings, the competition intensified. By 1902, more than 4,000 independent telephone exchanges had been established, serving 970,000 telephones, 44 percent of all telephones in the country. The independents thus made deep competitive inroads into the Bell System. By 1907, they operated 51

² See, for example, Ivan Selin, "Ma Bell's Spirit is Alive and Well in Moscow," *The Washington Post*, 8 June, 1986, p. F1.

percent of all telephones and carried 20 percent of all toll traffic. In the ensuing years, the Bell System launched a fierce campaign to forestall the creation of a nationwide independent telephone system competing with its own. By selectively slashing the rental rates on its equipment and prices for its service, dangling or withholding interconnection of independent exchanges with its own, and absorbing the independents into the Bell System through acquisition, AT&T managed to render the competition essentially in-occuous.

EFFECTS OF COMPETITION

The AT&T experience gave rise to decades of debate over the effectiveness and viability of competition in the telephone industry—whether AT&T's pricing practices were predatory, whether the independents were simply "creamskimming" or constructively competitive, whether telephony is a "natural monopoly", and indeed, whether competition in that industry is in the long run socially desirable. But while the literature on the economics of telephone competition is surprisingly thin,³ there is little question that, during this early period, competition worked. It greatly stimulated the extension of telephone service, the reduction of telephone rates, and technological improvements in telephony. All evidence points to the superiority of competition over *unregulated* monopoly. Whether it is superior to regulated monopoly is more dubious.⁴

MA BELL AS A REGULATED MONOPOLY

Having successfully monopolized the telephone business, AT&T began to embrace the notion of government regulation as a lesser evil than nationalization. (By 1912 most European countries had nationalized their systems, and the US Postmaster General was urging the same thing—under the euphemism "postalization"—for the U.S. telephone and telegraph systems). At the height of America's involvement in World War I in 1918, these systems were in fact placed under federal control for reasons of national defense, but the results were so unsatisfactory that the systems were returned to private control a year later. But private control was exercised under gradually tightened regulatory supervision—initially under the Interstate Commerce Commission and individual state regulatory commissions. In 1934, federal regulation was passed to the Federal Communications Commission under a much broader mandate. Under the pressure of FCC inquiries, Justice Department antitrust actions and court decisions, AT&T was gradually restrained from exercising its more blatant monopolistic practices (imposing barriers to entry, putting restrictions on interconnection, pricing its services without regard to cost, etc.). Competition in telephony began to reassert itself during the 1970s and the monopoly era came to an end with the court approval of the divestiture set-

³ One of the best recent studies is David S. Evans (ed.) *Breaking Up Bell*, New York: Elsevier, 1983.

⁴ For a discussion of this issue see Richard Gabel, "The Early Competitive Era in Telephone Communications, 1893-1920", *Journal of Law and Contemporary Problems*. Spring, 1969, pp. 340-369.

tlement in August, 1982, radically separating local telephone access from long-distance service.

AT&T AND MINSVIAZ' COMPARED

It is worth noting that AT&T's performance throughout this period does not fit the conventional popular image of a slothful, bureaucratic monopoly. On several counts, AT&T was a highly effective instrument of technical-economic development, often contrasting sharply with some of the characteristics we will note with respect to Minsviaz'.

MANAGEMENT AND PRIORITIES

AT&T is widely regarded as having had exceptionally competent, imaginative management that effectively, albeit conservatively, pursued the nationally-shared US objective, codified by the US Congress, of providing high-quality, reliable, affordable telephone service throughout the country. Because of the importance the US attached to this objective, AT&T's activities attracted much public attention and scrutiny.

Minsviaz' on the other hand—though we have little basis for judging the quality of its management—clearly did not enjoy any comparable national priority or Soviet leadership support, and its mission appears to have been both more ambiguous and less broadly conceived.

INVESTMENT

The amount of investment in the Bell System in recent decades has been truly massive. The value of its physical plant grew almost eleven-fold from \$10.4 billion in 1950 to \$113 billion in 1978. During the same period, its annual construction expenditures increased more than 15-fold from \$900 million to \$14 billion. The Bell System significantly boosted its rate of investment in the 1970s, and even more so in the 1980s, in response to the FCC's opening up of the markets to AT&T's competitors in the realms of terminal equipment (interconnect PBX) and in intercity private line service. The Bell System's reaction to the new entrants, thus, was not simply to "stonewall" and stifle the competition, but also to improve and expand its own services. Indeed, the 1970s and early '80s saw the introduction of an avalanche of new service features such as call camp-on and call-transfer; user efficiency features such as tone dialling and conference calling; and reliability and cost control features such as route optimization, call detail recording and tandem switching. The innovative drive became quite frenetic following divestiture in 1982.

Minsviaz', by comparison, seems to have been rather severely resource starved, at least through the 1970s. But even now, with its network-building mission strongly reaffirmed and its priorities raised, the projected rate of investment for the 12th FYP (2 billion rubles per year) for the Soviet telecoms sector as a whole seems paltry when compared to US capital formation in the same sector, which is currently running almost ten times as high.

R&D AND INNOVATION

Almost from its outset, the Bell System, being itself the product of a technological breakthrough, laid great stress on the application of science and innovation to telephony. Its Bell Laboratories, established in 1925, has long been extolled as the very model of an effective R&D institution. Through the decades of the Bell System's regulated monopoly status, Bell Laboratories was assured of sustained and generous funding by its parent organization through the fortuitous workings of the regulatory process. That process requires the FCC to scrutinize AT&T's costs carefully and to assure that it makes no more than a permitted rate of return over allowable costs. Since its operating revenues were embarrassingly high, AT&T's management found it politic and profitable in the long run to plough back large resources into research. Bell Labs (and the cause of innovation in telephony) thus benefitted from a steady flow of 2-3 percent annually of AT&T's operating revenues into its coffers.

The results were dramatic. By methodically incorporating state of the art advances based on highly consequential scientific inventions, the Bell System created an ever-expanding intelligent network, that has become a marvel of flexibility and versatility.⁵ The public "switched network" that has resulted from this massive evolutionary effort is capable of delivering both local and long distance service through a great variety of transmission facilities, including copper wire or fiber-optic cable; satellites and earth stations; central office switches, which receive voice calls on thousands of incoming lines and transfer them to thousands of outgoing lines; and packet switches which do the same thing for data.

Minsviaz' does have its own "proprietary" (i.e., in-house) R&D institutions, but their accomplishments remain obscure—and no doubt deservedly so. The continued heavy Soviet reliance on imported technology (both from Eastern Europe and from the West) for critical network components surely supports that judgment.

The exceedingly laggard introduction of stored program control central office digital switching into the Minsviaz' network offers one example of serious retardation in the Soviet telecoms innovation system. Digital electronic switching (especially of the high-bandwidth, ultra-reliable time-division variety) is a key building block of the modern network. The technology is by now well-established throughout the industrial West, with major telecoms equipment manufacturers in numerous countries offering such switches for export competitive with Bell's No. 4 ESS—and the even more sophisticated No. 5 ESS—which have become a standard of the industry.⁶ Moreover, some of the more advanced developing countries such as Brazil, Taiwan, India and Yugoslavia are well on the way to acquiring this production technology through subsidiaries of, or licensing agreements with, some of the above manufacturers.

⁵ For an excellent account of Bell Labs' role in the evolution of the digital network, see John S. Mayo, "Evolution of the Intelligent Network" *Science*, February 12, 1982.

⁶ They include France's Alcatel, Canada's Northern Telecom, Belgium's ITT, West Germany's Siemens, Sweden's Ericsson, Italy's Italtel/GTE, Japan's Fujitsu, Hitachi and NEC, the UK's Plessey/GEC and the Netherlands' Philips/AT&T.

The Soviet R&D establishment has not been able to master this technology. They have had to content themselves with a much earlier space-division, quasielectronic switching technology that dates back in the US to the mid-1960s. The Soviet KVARTS central office switching system epitomizes that technology. It was developed largely, if not entirely, by East Germany's Robotron, but did not enter series production in the Soviet Union until 1985. It is an analog, space-division, SPC exchange with a small line capacity. The digital, time-division central office systems that are now under development in the USSR have similarly small line capacities.

RELATIONSHIP TO EQUIPMENT SUPPLIERS

AT&T clearly benefitted from the master-slave relationship it established with its manufacturing arm, Western Electric, when it took over control of the company from Western Union in 1882. After consolidating several other telephone manufacturers into Western Electric, AT&T made the latter its exclusive manufacturing licensee. Under its contract, Western Electric was required to supply any equipment needed by the Bell operating companies at cost plus a 20 percent profit, but the operating companies had no reciprocal obligation to purchase from Western. Moreover, Western's production was reserved exclusively for the Bell System; it was prohibited from supplying equipment to the independents. Western thus became completely subservient to the needs of the Bell System, ensuring the latter a reliable flow of new equipment highly responsive to its needs, and a totally dependable supply of replacement parts for its older equipment.

This cozy, exclusionary relationship came in for a spate of anti-trust investigations in the 1930s and '40s, but AT&T managed to defeat the proposals for dismemberment of Western Electric by making some modest compromises, including limiting Western's business to providing equipment solely to the Bell System.

Minsviaz' has no comparable relationship to its equipment suppliers. On the contrary, it appears to suffer chronically from an almost total dependence on industrial ministries over whom it has little influence and who are oriented to the higher priority demands of the Ministry of Defense. The lack of a dependable domestic supply has no doubt been a major reason for Minsviaz' growing resort in recent years to joint undertakings with telecoms enterprises in Eastern Europe as well as continued heavy reliance on imports from the West—although access to the latter has been considerably impaired by the stiffened COCOM export controls imposed during the 1980s.

CONCLUDING COMMENT

The problems facing US and Soviet telecoms planners may not be as profoundly different as might appear at first blush. Basic differences certainly exist: The US telecoms environment is highly dynamic and information-conscious, quick to invest heavily in and to propitiate the new technologies, and favored with a highly advanced, diverse and flexible telecoms infrastructure. None of these qualities hold true for Soviet telecoms. But there are also some interesting similarities: In both countries there is recognition of the

indispensible role that rapid and versatile communications play in the information age; in both there is much agonizing over cost-efficiencies of alternative telecoms solutions; and both are vexed by large technological uncertainties. Indeed, in one respect, the USSR may enjoy something of an advantage: a much smaller investment in an existing network. A telephone network is an enormous investment, designed to pay for itself over many decades. The US, with its massive, highly effective but largely analog network, will take a very long time to convert to a fully-integrated, digital system. The Soviet Union, with its constricted, hopelessly obsolescent telecoms plant, could move relatively quickly into an all-digital system—at least in principle. But in the real world, that is most unlikely to happen, given the generally unpropitious structure of the Soviet telecoms industry described above, and three additional basic obstacles that are bound to impede the entire Soviet modernization effort: (1) limitations on technological mastery, (2) scarcity of investment resources and (3) hard-currency constraints on hi-tech imports. The conclusion seems unavoidable: a modern, integrated digital network will not emerge in the Soviet Union until well beyond the year 2000.

VIII. CONSUMPTION AND INCENTIVES

OVERVIEW

By Jean Farneth Boone*

Nikolai Ryzhkov, speaking at the 27th Communist Party Congress, observed that the achievement of Soviet growth goals under the 12th Five Year Plan would require the addition of 22 million individuals to the labor force if productivity remained at its current level. With an expected increment to labor of only 3.2 million persons over the Plan period, the unavoidable conclusion is that labor productivity must rise significantly if Soviet economic objectives are to be met. According to Ryzhkov, industrial labor productivity must increase from 3.1% annual growth during 1981-85 to 8.8% growth by 2000; two-thirds of this increase is to be generated by the introduction of new machinery and technology but the remaining one-third depends upon the "human factor."

A broad concept which refers to improving the motivation and productivity of Soviet workers, the human factor now encompasses a wide range of social, economic and political policies advocated by Gorbachev. Gorbachev's approach to the human factor problem appears to have evolved from an initial focus on strengthening discipline in the workplace to a desire to extend the process of "perestroika" (restructuring) to the individual worker himself, to restructure the way he thinks about his work and his place in society. The seven papers included in this section explore the many aspects of Gorbachev's effort to address the human factor—tightening labor discipline, increasing the availability of consumer goods and services, improving housing and health care, organizing labor more effectively, introducing greater wage incentives, providing new opportunities for participation and expression, and increasing the accountability of the leaders to the population.

In assessing the problems facing Gorbachev in these areas and the prospects for success of his policies, the authors suggest that some short term gains are likely, given a situation in which there appears to be so much room for improvement. However, they point out a number of dilemmas that remain to be resolved to allow for substantial and sustained improvement in consumption and incentives for the population and consequent gains in productivity. Among these are the need to strike the right balance between the use of "carrots and sticks," ensuring that measures enforcing labor discipline do not overwhelm the introduction of incentives; the need to link new incentives to more far-reaching reform initiatives

* Senior Research Assistant in Soviet Economics, Congressional Research Service.

in pricing, taxation, and distribution; and the need to generate popular support for a "rewriting of the social contract" based on efficiency criteria.

Elizabeth Teague notes that Gorbachev's first actions to mobilize the human factor emphasized the "stick" as he sought "to begin with those things that do not require major expenditure but which give quick and tangible results." Extensive personnel changes were undertaken with the purpose of eliminating corrupt officials of the Brezhnev era and replacing them with younger technocrats who would be responsive to new performance criteria—efficiency and increased accountability.

In addition, Gorbachev quickly launched an active campaign against alcohol consumption in order to eliminate some of the negative consequences on health, productivity, and social well-being arising from the "crisis proportions" of Soviet alcohol abuse. Vladimir Trembl, in his paper on the anti-drinking campaign, states that in the early 1980s, premature deaths due directly or indirectly to alcohol consumption comprised one-fifth of all deaths and were concentrated among men of working age. While rhetorical campaigns against alcohol abuse have been pursued in the past, Gorbachev's program has been implemented seriously and consistently, involving harsh penalties for drinking on the job or in public, restricted sales and increased prices of alcoholic beverages, and most far-reaching, significantly reduced production of vodka and fruit wines. According to Trembl, "in the first full year following the beginning of the campaign, the average consumption of alcohol compared with that of 1984 was reduced by half."

Although the direct impact of the anti-drinking campaign on labor productivity remains unclear, Soviet economic performance has improved in 1985 and 1986. Still, Trembl cautions that certain negative side effects of the campaign—significant reductions in state revenues from alcohol sales, the increased production of moonshine or samogon, and increased use of other narcotics or alcohol substitutes—may temper the benefits gained from reduced legal alcohol consumption. In order to diminish effectively the problem of alcoholism over the long term, the Soviet leadership must not simply maintain stiff penalties for excessive alcohol use (the symptoms of the problem), but must go further to address the cause of the problem, "the boredom and drabness of everyday Soviet life," by providing alternatives for consumption and leisure activity.

With respect to the lack of alternatives, the other papers in this section confirm the considerable shortage of goods and services currently available to Soviet society relative to most developed Western countries. Gertrude Schroeder notes that the share of total investment devoted to services ranged between 42 and 47 percent in the postwar period and has been falling since about 1960. Likewise, Michael Alexeev describes what Gorbachev himself has called the "acute housing problem" in the U.S.S.R., and Christopher Davis discusses the "serious performance problems throughout the health sector." Recognizing the importance for worker morale and motivation of a modernized service sector and a balance of supply and demand in consumer goods and services, Gorbachev has taken a number of new initiatives, launching the "Comprehensive Program

for the Development of Consumer Goods Production and the Service Sector for the Years 1986-2000," setting high growth targets for these areas in the 12th Five Year Plan, and approving numerous decrees and resolutions.

To increase the availability of services, Gorbachev's policies are designed to decentralize responsibility to the local level. Schroeder's paper notes new laws and regulations which give greater responsibility to enterprises for establishing social services and facilities both for their workers and for the public; greater responsibility and authority to local soviets for meeting the public's social welfare needs; and new responsibility to machinery producing ministries to create factory retail outlets which will sell and service the consumer durables they produce. To a large extent, these initiatives represent a "do-it-yourself" approach, as the local entities are expected to generate the needed financial, material and labor resources for social projects and services from their own reserves, without substantial new support from the state.

In the provision of housing, Alexeev sees some similar trends, noting the reorganization of the construction industry on a regional basis and the increasing emphasis on private and cooperative housing investments as a means of accelerating the pace of housing construction. But if the "record-breaking" targets for new housing construction contained in the 12th Five Year Plan—620-630 million square meters—are to be taken seriously, the share of state investment devoted to housing must be significantly increased as well. In the health sector, too, Gorbachev has taken a decentralizing approach, hoping to raise the quantity and quality of services available to the public by expansion of the number of fee-for-service outpatient clinics.

Perhaps the most far-reaching (and controversial) element of Gorbachev's policy for providing needed services to the population is the granting of new rights to individuals and cooperatives, discussed in the Blough and Muratore paper. By granting official sanction to some private activity now operating in the black market, Gorbachev may hope both to increase the quality and range of services available without expending new resources and to bring the existing private sector under state regulation. Under the law on individual labor activity, certain kinds of private enterprise are to be encouraged and facilitated by granting the rights to enter into contractual relationships with enterprises and to gain access to needed raw materials and tools. Other decrees provide new incentives for the creation of profit-sharing cooperatives in consumer services, food service, and production of consumer goods. According to Soviet economist Leonid Abalkin, in ten years, the activity of individual enterprises could comprise 4% of national income while cooperative enterprise might account for 10-12%.

All of these initiatives, as Blough and Muratore observe, seem to reflect "Gorbachev's willingness to confront past economic orthodoxy in an effort to improve consumer welfare" and his recognition of the close link between worker morale and the quality of life. But will Gorbachev's policies be effectively translated into increased labor productivity? Already, the conflict between innovation and traditional ideological and economic objectives has become evident, particularly in the discussion of private enterprise, threatening to

limit the effectiveness of newly granted rights. Demonstrating the leadership's desire to prevent the diversion of scarce labor from the state sector, the law on individual labor limits participation to housewives, students, and pensioners; state employees may participate only in their free time and no hiring of outside labor is allowed. Furthermore, the law on unearned income, which established harsh penalties for income derived from activity outside the official economy, may act as an additional constraint on the initiative and responsiveness of potential entrepreneurs by creating uncertainty over what activity is legal and what is not.

But even if the incentive aspects of new laws on services and consumer goods production prevail over continuing disincentives and if the necessary investment is in fact redirected into these areas, the leadership must also move to link access to these goods and services to productivity and efficiency criteria. Thus, reform of the system of wages—creating wider differentials based on profession and output and reducing the tendency toward “wage-levelling”—forms another important element in human factor policy. One aspect of Gorbachev's effort to link payment to productivity is the organization of labor into brigades, discussed by Meredith Heine-meier. She notes that although brigades now comprise a majority of the industrial workforce and nearly half of construction/installation workers, the most effective types of brigades—operating on a self-financing and contract basis—remain in the minority. Expansion and refinement of the brigade system of incentives, however, could contribute to labor productivity, worker morale, and the conservation of resources, as well as strengthening the link between wages and productivity.

Elizabeth Teague comments that “even when there are large differentials in people's money incomes from state employment, the incentive effect is often blunted by . . . the element of rationing, influence and corruption in an individual's command over goods and services.” Consequently, implementation of a far-reaching price reform that reduces state subsidies and establishes differentials based on supply and demand may also be necessary to make monetary incentives effective and meaningful. The question of pricing could apply specifically to the expansion of private business, where determination of prices will decide whether an enterprise will be profitable; to the housing sector, where reduction of state subsidies would absorb some consumer demand and allow for more efficient utilization of existing stock; and to health care, where fee-based services could be increased.

Though wage and price reforms may be crucial to the long-term success of Gorbachev's effort to activate the human factor, their full implementation would, as Teague suggests, “amount to a fundamental renegotiation of the terms of the existing ‘social contract.’” Thus, Gorbachev must generate broader support for his policies, not only within the leadership and the bureaucracy, but among the workers, peasants, and managers. It is for this purpose that Gorbachev may be seeking to “restructure man himself” through social and political policies that create more openness, flexibility, and participation in Soviet society. Through glasnost, multi-candidate elections, and other initiatives, Gorbachev may be able to encourage the kind of responsiveness of individuals in the

social and political sphere that he would like to see applied in the economic sphere.

To a large extent, Gorbachev's projections of increased and improved economic growth are dependent upon a substantial increase in productivity. The participants in Gorbachev's "human factor" reform must accept the incentive of increased benefit for changed attitude and effort, choosing change over the possibly more certain returns they will receive from continuation of the "old ways." To be activated, workers, peasants and managers may need new benefits in hand before they will be willing to move away from the safety net of the more egalitarian and controlled past. Party and government bureaucracies must also become constituents of change rather than advocates of the status quo, facilitating change rather than impeding acceptance of new incentives. Can Gorbachev convince, coerce, or cajol his human contributors to play a positive role in such a changing environment?

Clearly, Gorbachev has acknowledged in rhetoric and in action the critical role that the human factor, in all its facets, must play in the transformation of the Soviet economy. The broad range of policies he has introduced in the economic, social, and political spheres seek to evoke a response from Soviet society through both penalties and incentives. As many of the following papers describe, Gorbachev's task is complex and his solutions sometimes conflict with one another. Nevertheless, early achievements, even if small, may be sufficient to breed further success by building confidence among the population that current hard choices will in fact lead to significant future benefits.

GORBACHEV'S "HUMAN FACTOR" POLICIES

By Elizabeth Teague*

CONTENTS

	Page
Summary	224
The Need To Revitalize the Economy	224
Enter the "Human Factor"	225
The Violation of "Social Justice"	226
The Case for Systemic Reform	228
Gorbachev's Social Policies	229
A. Tightening Discipline	229
B. Reforming Wages and Incentives	231
C. Renegotiating the "Social Contract"	234
D. Widening Participation and Consultation	236
Popular Dissatisfaction With Gorbachev's Policies	238

SUMMARY

Gorbachev's most pressing task is to halt and reverse declining rates of Soviet economic growth. He has repeatedly asserted that this can be achieved only by "activating the human factor," that is, by effecting a radical and permanent change in the behavior of the Soviet workforce. Policies now being adopted or debated would, if successfully implemented, amount to a renegotiation of the existing "social contract" between leaders and led. In the absence of radical economic reform, however, what Gorbachev calls the "psychological restructuring" of the Soviet workforce is unlikely to prove an easy task.

THE NEED TO REVITALIZE THE ECONOMY

Soviet Party leader Mikhail Gorbachev's most urgent task is to halt declining rates of economic growth. Unless the Soviet economy can be made to function efficiently—that is, to make better use of its human and material resources—the USSR risks finding itself unable simultaneously to maintain its status as a military superpower, keep average consumption levels edging upward, and invest enough to prevent further slowdown in the future.

Most Western specialists blame the Soviet Union's economic problems on its initiative-stifling system of central planning. Gorbachev himself speaks of the need for "radical reform" of the economy, but his attempts at even modest economic decentralization have run into fierce resistance. He seems as a result to have

*Political analyst, Radio Free Europe/Radio Liberty, Munich, West Germany. The author is grateful to Keith Bush, Philip Hanson and Sergei Voronitsyn for their advice and comments.

become convinced that the economy will not be restored to health until social and political reforms have been realized. It is vital, Gorbachev has stated, as a first step "to activate the human factor," that is, to effect a fundamental change in the behavior of the workforce. People must learn "to think and work in a new way"; a means must be found to encourage creativity and reward initiative. Only when "a restructuring of people's thinking" has been achieved, Gorbachev told a meeting in Krasnodar in September 1986, "shall we be able to tackle our tasks."¹

ENTER THE "HUMAN FACTOR"

Western economists see the growth targets projected in the USSR's current (Twelfth) Five-Year Plan as unrealistically high. Growth of the two major factor inputs—capital and labor—has slowed markedly in the 1980s, and it is likely to be a decade at least before planned modernization of plant and machinery shows appreciable results. Yet Gorbachev appears to believe the targets he is calling for can be reached. Clearly, he is counting on some previously untapped resource. This is the "human factor"²—mobilizing the enthusiasm and energy of the population or, in the words of the leading Soviet sociologist Tat'yana Zaslavskaya, bringing about a situation where "exactly the same people using exactly the same material resources learn to achieve a better result."³ Exploitation of the human factor has therefore become an integral part of Gorbachev's policy of "intensification," that is, economic growth achieved by more efficient use of inputs and the application of modern technology.

There seems little doubt that unexploited human reserves do exist. Gorbachev has complained bitterly about the lethargy of the workforce. "We have forgotten how to work!" he exclaimed at an informal meeting with Soviet writers in the summer of 1986.⁴ Zaslavskaya asserts that barely one-third of the workforce work to the best of their ability; "the rest admit they work half-heartedly."⁵ Wastage is particularly acute among highly-qualified personnel; according to one Moscow enterprise director, 80 percent of the potential of the average blue-collar worker is exploited, but no more than 20 percent of the potential of the average engineer.⁶

Looked at from this angle, "activating the human factor" is just another attempt on the part of the authorities to squeeze more out of the long-suffering population. But there are other reasons why the Gorbachev leadership is turning the spotlight on the "human

¹ *Krasnaya zvezda*, September 19, 1986.

² "The concept of the 'human factor' is a comprehensive one. It includes both the physical capacities of people and their economic nature as the primary productive force, as well as their spiritual potential. However, the basic meaning, the nucleus and pivot of the concept are the social qualities of the members of society or, as K. Marx wrote, their 'essential forces'—their capacities and attitude toward work, the character of interactions between people and their communities, the level of their organization, discipline, activity and creativity." P.P. Lopata and A.V. Dmitriev, "Aktual'nye voprosy sotsial'nogo razvitiya sovetskogo obshchestva na sovremennom etape," *Istoriya SSSR*, No 1, 1986, pp. 3-21 at p. 5.

³ T.I. Zaslavskaya, "Vybory strategii," *Izvestiya*, June 1, 1985.

⁴ According to a *samizdat* account of the meeting published by Radio Liberty's *Arkhiv Samizdata* (hereafter AS) No 5785.

⁵ T.I. Zaslavskaya, "Chelovecheskii faktor razvitiya ekonomiki i sotsial'naya spravedlivost'," *Kommunist*, No 13, 1986, pp. 61-73 at p. 64.

⁶ Cited in Vasilii Parfenov, "Chelovecheskii faktor," *Pravda*, May 20, 1985.

factor." Soviet Marxism proclaims its goal to be creation of "the new man," yet today's Soviet workforce conspicuously lacks the qualities of adaptability and creativity essential for the successful running of a complex economy. In a speech in 1984, Gorbachev said that modern production requires "the thinking worker," one who is "well-organized, disciplined, educated, and of a new technological caliber." He complained that automated production lines, robots and machine-tools with programmed controls were already under-utilized because Soviet workers lacked the necessary qualifications.⁷

THE VIOLATION OF "SOCIAL JUSTICE"

A further reason for the preoccupation of the Gorbachev leadership with the "human factor" is its awareness that the corruption and abuse of official privilege that flourished under the leadership of Leonid Brezhnev led to a dramatic loss of confidence on the part of the general population in the Soviet system. In official terminology, people's belief in "social justice" was undermined by the blatant violation of the basic law of socialism—"from each according to his ability, to each according to his work." Graft, bribery and nepotism became seen as the keys to getting ahead, and people found cheating and stealing more profitable than honest labor. The gulf between the claims of the official ideology and the reality of everyday life provoked a moral crisis in Soviet society: cynicism and apathy became widespread; standards of workplace discipline fell; there were increasing signs of social disintegration (rising rates of crime, marital breakdown, drug abuse, alcoholism, and so on). What Zaslavskaya describes as "the alienation of a certain section of the population from social values"⁸ is seen by Gorbachev's leadership as a threat not only to economic performance but to social stability as well.⁹

Josef Stalin governed the Soviet population by fear and intimidation. The workers who carried out his program of forced industrialization in the 1930s earned, on average, the bare minimum necessary to stay alive. Legislation was adopted that forbade workers and peasants to leave their farms and factories without official permission, while harsh measures were introduced to punish anyone found guilty of infringing labor discipline.

Stalin's successors realized that purely coercive measures were becoming dysfunctional; a modernizing economy needs creative and adaptable workers, not craven slave laborers.¹⁰ But while Stalin's heirs began to dismantle the apparatus of overt terror with which he had disciplined the workforce, they failed to replace it with an adequate system of incentives that would, once the fear of punishment was removed, motivate people to work well. Instead, they

⁷ M.S. Gorbachev, "Zhivoe tvorchestvo naroda," Moscow: Politizdat, 1984, p. 23.

⁸ T.I. Zaslavskaya, "Po printsipu sotsial'noi spravedlivosti," *Trud*, July 15, 1986.

⁹ See Peter Frank, "Gorbachev's Dilemma: Social Justice or Political Instability?" *The World Today*, June 1986, pp. 93-5.

¹⁰ A recent article by two Soviet social scientists recognizes that "... the cult of personality had serious consequences on the formation of the human factor. It inhibited the development of the creative abilities of the workers, giving rise in some to careerism, in others to insecurity and passivity and, in some, to a desire to avoid personal responsibility." Lopata and Dmitriev, *loc. cit.*

reached an informal "social contract" with the population—scornfully described by Soviet workers as "They pretend to pay us, and we pretend to work." The state pledged to provide the population with a low-grade but comprehensive system of social welfare that included full employment, job security, subsidized food prices, and a slow but steady improvement in popular living standards. In return, the authorities required the population to remain politically and socially quiescent.

Lacking effective incentives to reward effort, the USSR has been dogged since the late 1950s by declining rates of economic growth and a level of labor productivity that is low by comparison with those of other industrialized countries. In the 1970s, the rate of growth of labor productivity decelerated even more markedly than the overall rate of economic growth.¹¹

The existing economic system has a strong tendency to generate wage-leveling and labor-hoarding.¹² Enterprise managers are primarily concerned to maximize output; to be sure of meeting production targets comfortably and of fulfilling changing output plan targets, they try to keep as much spare labor on the payroll as they can. Far from being motivated to economize on labor costs, enterprises compete to attract and retain staff, sharing pay and bonuses more or less equally among workers regardless of quality of output. A manager cannot be sure of benefitting in the long run from any improvement in labor productivity secured by sharper wage differentiation because, if he does achieve such an improvement, his future targets are merely likely to be adjusted upward by the central planners. Meanwhile, those of his workers who lose out from greater bonus differentiation because they are lazy or less skilled can easily move on to jobs elsewhere, leaving the enterprise with a smaller labor "reserve" with which to meet periodic demands such as calls for help with seasonal agricultural tasks. For the same reason, managers tend to turn a blind eye to poor workmanship, and sackings for labor discipline offenses are relatively rare.¹³

To sum up, Soviet workers find themselves with little if any incentive to work hard. The workforce of today, Zaslavskaya says, enjoys "a choice of strategies." The first offers "maximum reward for maximum work"; the second "a guaranteed income in return for minimum work."¹⁴ Given the chronic shortages of desirable consumer goods in Soviet stores, it is hardly surprising that many workers opt for the second strategy, saving their energies for black market activities. As another social scientist, Stanislav Shatalin, admits, the USSR has failed to create "a powerful and comprehensive mechanism of motivation to ensure the economically efficient

¹¹ This broad description of developments is based on CIA measures of Soviet growth.

¹² For fuller discussion of this question, see Philip Hanson, "The Serendipitous Soviet Achievement of Full Employment: Labour Shortage and Labour Hoarding in the Soviet Economy," in David Lane (ed.), *Labour and Employment in the USSR*, Brighton: Wheatsheaf Books, 1986, pp. 83-111.

¹³ Managers do have the power to sack errant workers; often, however, they do not see it as in their own interests to enforce the letter of the disciplinary code. But they can and frequently do sack employees whom they find personally troublesome, such as workers who try to "blow the whistle" on managerial malpractice; see Nick Lampert, "Job Security and the Law in the USSR," in Lane, *op. cit.*, pp. 256-77.

¹⁴ T.I. Zaslavskaya, "Tvorcheskaya aktivnost' mass: sotsial'nye rezervy rosta," *EKO*, No 3, 1986, pp. 3-25 at p. 8.

use of production resources."¹⁵ It is generally agreed that an attempt to return to the outright coercion of the Stalin era would be counterproductive. In the words of Fedor Burlatskii, one of the USSR's most eloquent advocates of political and economic reform, "How can you force someone to invent more, to think better, to work more efficiently?"¹⁶ In these circumstances, what solutions are open to Gorbachev's leadership?

THE CASE FOR SYSTEMIC REFORM

The social need for reform of the Soviet economy has been forcefully put by Zaslavskaya in the so-called "Novosibirsk document"—an unpublished report leaked to the Western press in 1983. In it, she argues that the Soviet Union's economic system, which has remained essentially unchanged since the 1930s, is incapable of forging the "new man" needed to manage today's scientific and technical revolution. While an economic system that treated the workers like cogs worked well enough when the labor force was passive, obedient, and poorly educated, it is no longer suitable now that the workforce is well educated and materially secure. In Zaslavskaya's words:

The social mechanism of economic development at present operating in the USSR does not ensure satisfactory results. The social type of worker formed by it fails to correspond not only to the strategic aims of a developed socialist society, but also to the technological requirements of contemporary production. Many workers are characterized by . . . low labor- and production-discipline, an indifferent attitude to the work they do and its poor quality, social passivity, a low value attached to work as a means of self-realization, intense consumerism, and a rather low level of moral discipline.¹⁷

Systemic factors are not the only cause of the Soviet Union's deteriorating economic performance, but they may well be the most important. Zaslavskaya says the existing system creates "helpless people . . . only able to follow directives from above";¹⁸ it is, she maintains, "incapable of making efficient use of society's labor and intellectual resources."¹⁹ She recognizes that attitudes built up over decades cannot be changed quickly, but believes that change for the better can be achieved through structural reform.

Gorbachev spoke at the Twenty-seventh Congress of the Soviet Communist Party (CPSU) in February 1986 of the need for "radical reform" of the economy,²⁰ yet he seems to hold no brief for market socialism and to favor instead "rationalization" or "streamlining" of the existing centrally administered system. He appears, too, to believe that popular apathy is so strong that, until it is overcome, other changes will be impossible. "We must start the reorganization by reorganizing man himself," Gorbachev has asserted.²¹ What policies, therefore, is the new leader pursuing?

¹⁵ S. Shatalin, "Sotsial'noe razvitie i ekonomicheskii rost," *Kommunist*, No 14, 1986, pp. 59-70 at p. 62.

¹⁶ Fedor Burlatskii, "Razgovor nachistotu," *Literaturnaya gazeta*, October 1, 1986.

¹⁷ AS No 5042. For an English translation, see *Survey*, Spring 1984, pp. 88-108.

¹⁸ T.I. Zaslavskaya, "Vybory strategii," *Izvestiya*, June 1, 1985.

¹⁹ AS No 5042.

²⁰ *Pravda*, February 26, 1986.

²¹ *Moscow television*, April 8, 1986.

GORBACHEV'S SOCIAL POLICIES

A. TIGHTENING DISCIPLINE

Gorbachev lost no time, after taking office in March 1985, in reviving the campaign for stricter labor discipline initiated by Yuriĭ Andropov. Gorbachev's efforts to mobilize the human factor by strengthening discipline have not, however, been carbon-copies of Andropov's. His leadership appears to appreciate the inherent weakness of a "campaigning" approach for, after an initial impact, discipline drives launched both under Brezhnev in 1979 and under Andropov in 1983 rapidly ran out of steam. Brezhnev's campaign offered workers the "carrot" of material rewards for harder work, while Andropov's used the "stick" of tougher penalties for bad behavior; neither achieved sustained improvement.²²

Seen against this background, the purpose of Gorbachev's calls for stricter discipline and order seems to have been to give a short, sharp boost to popular morale after a period of drift and uncertainty. His public statements bear out this supposition. Speaking in Leningrad in May 1985, Gorbachev said:

At the first stage of the fight for more rapid economic development, we can and must squeeze more out of the economy by imposing more order and increasing labor, technological and state discipline.²³

"It is sensible," he told the Twenty-seventh Party Congress in February 1986, "to begin with those things that do not require major expenditure but which give quick and tangible results."²⁴

Gorbachev's "new broom" approach has included extensive personnel changes. He has concentrated, to a much greater extent than Andropov was able to do, on sweeping out old, corrupt, and inefficient officials of the Brezhnev generation and replacing them with younger, predominantly technocratic appointees. This process of house-cleaning seems partly aimed at restoring popular confidence in the "social justice" of the Soviet system, for wide publicity has been given to the misdeeds of some of those who have lost their jobs. It has also, of course, enabled Gorbachev to lay the foundations of a personal power base. There is as yet no sign that the purge of the bureaucracy has run out of steam; indeed, it may well be speeding up as new appointees at regional and ministerial level start to make their own appointments at lower levels of the hierarchy.

As far as the majority of Soviet citizens are concerned, the most tangible change introduced by the Gorbachev leadership has been the widely unpopular campaign against alcoholism. The topic is discussed elsewhere in this volume, so it will be enough here to note that the campaign fits Gorbachev's attempt to boost economic growth by "activating the human factor," that is, by changing the behavior of the workforce. (At the end of 1986, the official Soviet news agency was claiming that worktime lost due to absenteeism had fallen by one-third in the first eleven months of the year.²⁵) As

²² See Elizabeth Teague, "Labor Discipline and Legislation in the USSR: 1979-85," Supplement to the Radio Liberty Research Bulletin (hereafter RL), No. 2/85, October 16, 1985.

²³ *Radio Moscow*, May 21, 1985.

²⁴ *Moscow television*, February 25, 1986.

²⁵ *Tass*, December 26, 1986.

Moscow television informed viewers soon after the campaign was launched:

The struggle against drunkenness is a struggle not simply for the health of citizens but also to strengthen the country's economy, organization and order.²⁶

Gorbachev and his colleagues seem to appreciate that drives to tighten discipline can yield only short-term benefits unless they are combined with further-reaching measures. In particular, they recognize that many of the Soviet Union's social and economic problems, of which the declining rate of labor productivity growth is only one, have been caused by longstanding neglect of the interests and needs of the general population.²⁷ Since Gorbachev's election the mass media have for the first time acknowledged that sickness, rather than fecklessness on the part of the workforce, is to blame for "the overwhelming majority" of losses of worktime in many branches of the economy.²⁸ This fact had previously been noted only in specialist journals. Speaking in Krasnodar in September 1986, Gorbachev stated that a major program to improve the quality of Soviet health care was being prepared.²⁹

A tough stance has been taken by Moscow's new Party boss, Boris El'tsin, who seems, of all the members of the top leadership, closest to Gorbachev in style and thinking. Soon after his appointment El'tsin announced the adoption of measures first to restrict, and eventually to eliminate entirely, the import of migrant manpower to the capital city.³⁰ "We don't need to bring in new people," he told a meeting in April 1986, "what we need is to make Muscovites work harder."³¹

To compensate for the curtailment of migrant labor, El'tsin ordered a clampdown on so-called "idlers" and "parasites" in the Soviet capital. Every Moscow resident of working age was required to register with the local Soviet (the organ of local government). Anyone found not to be in full-time work or study was promised help obtaining employment, but the militia would be informed of anyone refusing to engage in "socially-useful work," and such persons would become liable for prosecution under the existing "parasite" laws.

The Moscow scheme was reminiscent of earlier campaigns conducted in parts of Belorussia, Georgia, and Latvia. Those schemes were carried out in relatively small areas, however, whereas that in Moscow involved the registration of millions of people. Its purpose was said to be "to improve the use of labor resources," but the reference to "socially-useful work" suggested that a concomitant aim was to crack down on the large numbers of Moscow residents living on the "second," or illegal, economy. A similar scheme has

²⁶ *Moscow television*, July 13, 1985.

²⁷ Speaking at the Twenty-seventh Party Congress, Gorbachev deplored the use of what he called "the residual principle" in allocating resources to social needs; *Moscow television*, February 25, 1986. For assessments of recent policies, see Walter D. Connor, "Social Policy under Gorbachev," *Problems of Communism*, July-August 1986, pp. 31-46; and Aaron Trehub, "Social and Economic Rights in the Soviet Union: Work, Health Care, Social Security, and Housing," *RL Supplement*, No. 3/86, December 29, 1986.

²⁸ *Izvestiya*, March 19, 1985.

²⁹ *Radio Moscow*, September 18, 1986.

³⁰ *Vechernyaya Moskva*, June 12, 1986.

³¹ For a samizdat account of El'tsin's remarks, see AS No 5721; for a French translation, see *Le Monde*, July 16, 1986.

recently been launched by the newly-appointed Party leader in Kazakhstan, Gennadii Kolbin.

Black market activity also came under attack in the course of the new leadership's campaign to stamp out corruption and restore public confidence in "social justice." This included the adoption of fresh measures to crack down on so-called "unearned incomes." The term denotes a multitude of ill-gotten gains—theft of state property, bribery, speculation, moonlighting—in short, any income not derived from employment in the official economy. (Purists would even include legally paid wages and bonuses financed by false reporting of enterprise output³² and over-indulgent presents from fond parents to their sons and daughters.³³) The new leadership announced the adoption of stiffer penalties for those found guilty of speculation and embezzlement, and sought to close loopholes by introducing new controls. In future, any private transaction involving more than 5,000 rubles would have to be made through a bank, while anyone making a purchase valued at over 10,000 rubles, or building a house costing more than 20,000 rubles, would have to register the deal and provide the authorities with details of the source of his or her income.³⁴

At the same time, Gorbachev's leadership has encouraged the development of cooperatives and small family businesses, and has legalized certain kinds of private enterprise (officially known as "individual labor"). These moves were clearly controversial. Legislation regulating "individual labor activity in the fields of domestic crafts, farming, and consumer services for the population" came up for discussion by the Politburo in March 1986, at the same time as measures against "unearned income."³⁵ But while the regulations clamping down on unearned income were announced in May 1986, and came into effect the following July, measures legalizing certain forms of private economic activity were not announced until November 1986, and did not come into effect until May 1987.³⁶ Moreover, the restrictive character of the new measures indicated that they were the product of behind-scenes wrangling over how much freedom Soviet citizens should be permitted in this sensitive area. Thus, "individual labor" was to be tolerated only in a worker's free time, housewives, pensioners, and the disabled alone being permitted to engage in it on a full-time basis. And the traditional Marxist taboo against "hired labor" held good: private businesses were to be restricted to single individuals or family members.

B. REFORMING WAGES AND INCENTIVES

Wage-reform constitutes the Gorbachev leadership's medium-term strategy to encourage harder work in return for higher benefits. To restore popular confidence in "social justice," the new leadership has stated its intention of correcting the Brezhnev era's

³² A. Skokhin, "Otkuda berutsya netrudovye dokhody?" *Ekonomicheskaya gazeta*, No. 1, 1986.

³³ V.Z. Rogovin, "Sotsial'naya spravedlivost' i sotsialisticheskoe raspredelenie zhiznennykh blag," *Voprosy filosofii*, No. 9, 1986, pp. 3-20 at p. 15.

³⁴ *Pravda*, May 28, 1986; *Vedomosti Verkhovnogo Soveta SSSR*, No. 22, 1986, pp. 369-73.

³⁵ *Pravda*, March 28, 1986.

³⁶ *Izvestiya*, November 20, 1986. Leonid Abalkin, a prominent Soviet economist, later confirmed in an interview with Western journalists that legislation on individual labor was originally intended to be enacted at the same time as the measures on "unearned incomes"; *Boston Globe*, November 28, 1986.

steady trend toward wage equalization by widening wage differentials and increasing managerial control over salaries and manning levels. Wage increases are in future to be paid for out of enterprise profits.

Gorbachev has called, too, for wider application of the brigade system of labor organization, which seeks to raise the correlation between output and the pay workers receive for it. This aspect of policy is discussed elsewhere in this volume.

It is upon the initiative and creativity of the technical intelligentsia—the Soviet Union's 31 million "yuppies"³⁷—that Gorbachev's hopes for scientific and technical progress depend, and it was with them in mind that, only one month after his election, Gorbachev ordered a review of the salary scales of scientific and technical personnel.³⁸ (Meanwhile, Gorbachev's policies of greater openness in the media and of cultural liberalization, which are discussed below, are aimed at winning the support of the cultural intelligentsia.)

Soviet economists argue that at present real income differentials do not adequately reflect productivity differentials. In other words, people whose work is especially valuable, or who do a particular job more efficiently than their fellow-workers, should be encouraged and rewarded with higher real incomes. This may at first seem redundant advice, for Soviet blue-collar workers are already paid on a piece-rate basis to a greater extent than blue-collar workers in most Western countries, and there is an array of skill grades, bonus payments, and other differentials.

However, several features of the Soviet wage structure are widely seen as discouraging workers from expending effort, improving their skills, and seeking promotion. One is the notoriously low relative pay for certain skilled and professional personnel: junior medical staff, design engineers, teachers, and so on. Another is the tendency of managers—already described above—to practice wage-leveling in payments to their staff. The output norms on which piece-rate calculations are based are kept slack, and bonuses are distributed evenly among staff, regardless of individual performance. Workers with low levels of skill are often promoted to higher skill grades so that they can be paid more. Since ministry-level officials tend in turn to aim at modest levels of total bonuses, distributed fairly evenly among enterprises, the bonuses related to enterprises' overall "success indicator" performance are themselves not highly differentiated.

Even when there are large differentials in people's money incomes from state employment, the incentive effect is often blunted by differences in access to goods and services and in earnings from the second economy, and in general by the element of rationing, influence and corruption in an individual's command over goods and services. One aspect of this is the lack of differentiation in prices for many items—with standard rental rates for state housing in more or less desirable locations, for example. Thus advocacy of greater incentive payments is now being accompanied by calls for wider differentials in state pricing. At present it is a major source of real-income advantage to possess a Moscow residence permit or

³⁷ So described by Ernst Kux, *Neue Zuercher Zeitung*, September 28, 1985.

³⁸ *Pravda*, April 12 and 24, 1985.

to have time to spend standing in line—neither of which has anything to do with performance at work. There have accordingly been several suggestions that wage reform should be accompanied by the introduction of differentiated rental rates for housing, private plots and dachas (country cottages), a progressive inheritance tax, a graduated income tax and also, perhaps, a wealth tax.³⁹

The advocates of greater differentiation in pay and bonuses do not necessarily want greater inequality in real incomes (however that might be measured). But they do want more purposeful inequalities, more closely related to individuals' contributions to output. The economist Natal'ya Rimashevskaya, for example, argues that social consumption should be distributed according to need while incomes from work should be more unequal than at present. (She says that the top ten percent of earners in industry earn three times the income of the bottom ten percent, and that this ratio is "obviously not [large] enough.")⁴⁰

Official endorsements of stronger incentives and denunciations of wage-leveling have been commonplace for years, but under Brezhnev's leadership little was done to follow up such pronouncements. Since his death, however, rather more has been done. An experiment instituted in 1983 in Leningrad introduced greater differentiation to the pay of research and development (R and D) staff with the aim of encouraging those research engineers who generated new technology and good designs. Judged a success in Leningrad, the scheme has since been extended more widely, but with mixed results. Speaking in Krasnodar, Gorbachev complained:

You know, we have already adopted a sound decision. Something is not quite working. . . . These matters are getting lost somewhere. We suddenly discovered that everything we had adopted on the basis of the experiment in Leningrad—where this matter had got off the ground well—was suddenly applied in such a way as to give engineers and technicians five to seven rubles more each. This was not the aim, not the aim at all.⁴¹

Since Gorbachev's ascent to power, several other measures have been introduced which are meant to create more purposeful income differentials. Under a joint decree of the CPSU Central Committee, the USSR Council of Ministers and the All-Union Central Council of Trade Unions (AUCCTU) adopted in the summer of 1985, pay for R and D and design staff in industry and the USSR Academy of Sciences was to be made more dependent on variable bonuses and less on fixed pay-scales.⁴² Another joint decree published at the end of 1985 sought to raise the relative pay of factory foremen.⁴³ Pay-scales of medical personnel are to be raised in several stages during 1986–91, following a Politburo decision of October 1986,⁴⁴ while a number of other decrees seek to "correct" various inter-occupational disproportions.

³⁹ Rogovin, *op. cit.*, pp. 17–18; *idem*, *Komsomol'skaya pravda*, November 12, 1985; Shokhin, *op. cit.*; L. Velikanova, "Kazhdoi sem'e—otdel'nyu kvartiru," *Literaturnaya gazeta*, September 24, 1986; T.I. Zaslavskaya, "Taktika peremen," *Izvestiya*, April 18, 1986. The measures adopted against "unearned incomes" call for "greater use of declarations" to check the legality of citizen's incomes and, perhaps, to facilitate the levying of a graduated income tax; *Pravda*, May 28, 1986.

⁴⁰ N. Rimashevskaya, "Raspredelenie i spravedlivost'," *Ekonomicheskaya gazeta*, No. 40, 1986.

⁴¹ *Radio Moscow*, September 18, 1986.

⁴² *Ekonomicheskaya gazeta*, No 29, 1985.

⁴³ *Pravda*, December 12, 1985.

⁴⁴ *Ibid.*, October 17, 1986.

The most general pronouncement on wages so far published is the joint Central Committee, Council of Ministers and AUCCTU decree of September 1986, "On the improvement of the organization of wages and the introduction of new pay-scales and appointment salaries for workers in the material production sectors."⁴⁵ This has been followed by temporary statutes devised by the State Committee for Labor and the AUCCTU to guide its implementation. Piece-rate norms are supposed to be tightened and enterprises encouraged to shed surplus workers (to the benefit of the pay of those remaining). Procedures for retraining and reallocating redundant workers, to be observed by the local Soviets, have also been set out.⁴⁶

These revised pay-scales will affect 75 million workers. Increases will be proportionately larger for highly-qualified staff than for others. Piece-rate payments are to vary proportionately with output, rather than less than proportionately, as was previously the case. Differentials between engineers and blue-collar workers are to be increased. Enterprise managers are to have more discretion over the allocation of bonuses, with enterprise directors allowed to receive bonuses of up to 75 percent of their base pay.⁴⁷

The restructuring of basic pay-scales will presumably be implemented, for it does not depend much on discretionary action below the level of the top leadership. It ought to help with some incentive problems of a relatively long-term character: the exit of qualified engineers into less skilled but better paid work, for example.

It is enterprise managers, however, who manipulate skill gradings and equalize bonus payments among workers. Their behavior is not easily modified by decrees for it is reinforced by two fundamental features of the Soviet economic system: (a) the general excess demand for labor, and (b) the lack of any reliable medium- or long-term benefits accruing to an enterprise as a reward for improved performance. As noted above, the Soviet economic system shows a strong tendency to generate wage-leveling. Unless there is a radical change of the system, decrees intended to counter such leveling are unlikely to be successful as far as enterprise behavior is concerned.

C. RENEGOTIATING THE "SOCIAL CONTRACT"

The incentive effects of increased money income differentials might, however, be strengthened by more effective differentiation in the pricing of consumer goods and services. One possible development on this front is the channeling of a larger part of total food supplies to the non-farm population through the peasant markets and contract selling by consumer cooperatives, at the expense of lower-priced state store sales. The reduction of state subsidies for food and consumer services;⁴⁸ the expansion of charges for medical

⁴⁵ *Ekonomicheskaya gazeta*, No 43, 1986; *Pravda*, November 3, 1986; *Trud*, December 19, 1986.

⁴⁶ *Ekonomicheskaya gazeta*, No 44, 1986.

⁴⁷ *Izvestiya*, September 26, 1986.

⁴⁸ G. Lisichkin, "Razmyshleniya u myasnogo prilavka," *Trud*, August 22, 1986. The state subsidy on meat and dairy products alone in 1986 was projected to be about 50 billion rubles, i.e., roughly \$70 billion at the official rate of exchange, or more than double the European Community's Common Agricultural Policy total or the US farm subsidy; *Argumenty i fakty*, No. 21, 1986.

care;⁴⁹ and the introduction of greater differentiation in state housing rents⁵⁰ have all been proposed.

The effect of such changes would be to enhance the role of personal incomes and increase the responsibility of the individual to care for himself, while reducing the role of state subventions more to that of providing basic protection for members of society unable to take care of themselves. Proposals such as these are a matter of considerable political sensitivity, however, and are likely to be approached by the leaders only with great caution. They would amount to a fundamental renegotiation of the terms of the existing "social contract."

A reduced role for state subsidies is not the only controversial proposal. Some writers have begun to question two other planks of the "social contract": full employment and job security. Shatalin states that enhancing the incentive role of wages is not enough to motivate people to work well; it is also necessary to introduce the threat of dismissal. Calling for a shift away from the traditional concept of "full employment" to what he calls "socially and economically effective rational full employment," Shatalin writes:

The principles of socialism are not principles of charity which automatically guarantee a job for everyone regardless of his ability to work at it. A person ought to have to wage a daily economic struggle to hold on to a job that suits his abilities.⁵¹

Other specialists have pointed out that, as the economy modernizes, workers will have to be ready to undergo retraining or even relocation. The economist Vladimir Kostakov has predicted that between 13 and 19 million jobs will be eliminated in the manufacturing sector by the end of the century if targets for labor productivity growth are achieved, and he says redundant workers should shoulder the responsibility of finding new jobs themselves:

The need to look for a job—a necessity that many now working in manufacturing and services will certainly face—may also be new and unaccustomed for us. We are used to the exact opposite—work seeking the person. . . . Obviously, considerable psychological reorientation will be required. We consider it natural and necessary that if, through objective causes, a job slot becomes unnecessary, the worker must immediately be given another job. . . . Now we shall have to get used to the idea that finding employment is, to a considerable extent, the worker's own responsibility and that the search may require a certain amount of time—a sufficient, but not an unlimited amount.⁵²

Zaslavskaya warns that for some members of society this may prove a painful experience. She seems to think this will not be altogether a bad thing, since it will lead to an overall improvement in labor discipline:

There is no doubt that the necessity of transferring to branches of production where labor is scarce, and of moving to other areas and cities, will be faced primarily by workers who are the least valuable from the point of view of the work collective, who are indifferent to work and output quality, and who take an inactive part in social life, to say nothing of idlers, drunkards, rolling stones, and so on. Such a situation will lead to . . . stronger labor discipline and an increase in the quality of work.⁵³

⁴⁹ "Platnaya poliklinika: za i protiv," *Izvestiya*, July 11, 1986.

⁵⁰ Zaslavskaya, "Chelovecheskii . . .," pp. 72-3; Velikanova, *op. cit.*

⁵¹ Shatalin, *op. cit.*, p. 63.

⁵² V. Kostakov, "Odin, kak semero," *Sovetskaya kul'tura*, January 4, 1986.

⁵³ Zaslavskaya, "Chelovecheskii . . .," p. 70.

To some extent, the process has already begun. Gorbachev has given his personal blessing, for example, to an experiment conducted by the Belorussian railway service, where measures to raise productivity by shedding staff led to the release of 12,000 workers in little over a year.⁵⁴ Some 3,200 officials lost their jobs in 1985 as a result of the merger of six agricultural agencies into the State Agroindustrial Committee, and were granted what amounted to unemployment benefits for up to three months while they looked for new posts.⁵⁵ And, as noted above, procedures for retraining workers made redundant in other branches of the economy have recently been established which include severance payments for those released.⁵⁶ The concept of severance pay is virtually unheard of in Soviet experience.

It must however be stressed yet again that, in the absence of radical economic reform, the strong tendency of the existing system to encourage enterprises to hoard labor may negate the best efforts of the Kremlin leaders to make job tenure conditional on a worker's performance.

D. WIDENING PARTICIPATION AND CONSULTATION

In a speech in Krasnodar in September 1986, Gorbachev for the first time described the "democratization" of Soviet society as his main priority. He said that when he was talking to the crowds on the city streets earlier in the day:

I thought of how much our people has grown up, of what intellectual potential it possesses, creative potential, and of how, in resolving issues in the country, we still do not make use of this potential, relying on administrative injunction, giving orders, and issuing commands.

"We must," Gorbachev went on, "include the people in the process of restructuring via the democratization of society."⁵⁷ "Our people," he stated the following day, "have matured to the extent that it must be trusted to administer itself."⁵⁸

Burlatskii describes Gorbachev's call for democratization as a "sensational" departure, because "previously we used only [the term] 'the further development of socialist democracy.'" What Gorbachev was saying in Krasnodar, Burlatskii asserts, was that without democratization, that is, without political reform, the Soviet Union will not be able to attain its economic goals.⁵⁹

There are few signs at present that the new leadership is planning systemic reforms of a political nature. It is true that certain writers and intellectuals can be found in the pages of the Soviet press calling for quite radical changes, but they do not appear to represent the mainstream. Gorbachev himself seems on present evidence to favor a streamlining rationalization that would make the existing system function more efficiently while leaving central planning and (even more important) one-Party rule intact. Burlats-

⁵⁴ RL 318/86, "The Belorussian Railway Experiment: A New Shchekino?" by Aaron Trehub, August 20, 1986.

⁵⁵ *Pravda*, November 26, 1986.

⁵⁶ *Ekonomicheskaya gazeta*, No. 44, 1986.

⁵⁷ *Moscow television*, September 18, 1986.

⁵⁸ *Radio Moscow*, September 19, 1986.

⁵⁹ Quotations from RL 396/86, "Interview with Fedor Burlatsky," by Henry Hamman, October 10, 1986; and from Burlatskii's talk delivered at the University of Surrey on November 9, 1986.

kii himself has said that it is not yet clear exactly what "democratization" entails in a single-Party system. And, he added, "we don't want to change the one-Party system."⁶⁰

The most striking elements of Gorbachev's "democratization" so far are (a) liberalization in the cultural sphere and greater openness in the mass media; (b) electoral reform; (c) increased worker participation in management.

Where cultural policy is concerned, Gorbachev is seeking the aid of the intellectuals for his modernization program. "I need the support of the intelligentsia," he told the Moscow theater director, Oleg Efremov, in the summer of 1985.⁶¹ As for his campaign for openness (*glasnost'*) in the mass media, Gorbachev's aim is, first, to shock the public out of its inertia and cynicism and, second, to focus public attention on the negative aspects of Soviet daily life so that, in the course of general discussion, solutions can be found. Western observers note that criticism of the system itself is not tolerated. The purpose of *glasnost'* is to make the existing system work more efficiently; it does not involve recognition of the right to freedom of speech. Burlatskii insists, however, that *glasnost'* has an additional function, that is, to increase the influence of public opinion over government decision-making. Since the Twenty-seventh Party Congress, the role of public opinion has indeed grown in certain areas, of which environmental protection is the most noticeable.⁶² Thus, public opposition was stated to have been a major factor in the Politburo's decisions to halt work on the planned diversion of northern and Siberian rivers into the southern regions of the USSR, and to seek a new design for a controversial World War II victory monument to be erected in Moscow.⁶³ The quick reaction of the Latvian government, in November 1986, to public opposition to plans to construct a new hydroelectric power station in the republic was also unusual.⁶⁴ And the publicity given to cases where public opinion has played a role is likely to encourage further such activity.

Participation is not to be restricted to the intelligentsia. "Restructuring," Gorbachev has repeatedly stated, "must be carried out from below and from above."⁶⁵ At a plenary meeting of the Central Committee of the CPSU in January 1987, Gorbachev made far-reaching proposals for electoral reform,⁶⁶ including the introduction of multiple candidacy in local government elections. Previously, Soviet voters had no choice at all, being presented with a single, officially-approved candidate in each constituency; this was said to have led to widespread indifference on the part of the electorate.⁶⁷ Multiple-candidacy was introduced on an experimental basis in some local government elections in June 1987. Multiple-candidacy and secret balloting are also being tried out in elections

⁶⁰ *Ibid.*

⁶¹ *Die Zeit*, July 26, 1985. See also Gorbachev's speech to the writers; AS No 5785.

⁶² RL 391/86, "*Glasnost'* in the Soviet Media since the Twenty-seventh Party Congress," by Vera Tolz, October 20, 1986.

⁶³ *Pravda*, August 16, 1986.

⁶⁴ Radio Free Europe Research, "Latvia in 1986," by Dzintra Bungs, December 17, 1986.

⁶⁵ For example, *Moscow television*, September 18, 1986.

⁶⁶ *Pravda*, January 28, 1987.

⁶⁷ V. Vasil'ev, "Vlast', otkrytaya dlya vsekh," *Literaturnaya gazeta*, September 17, 1986; *idem*, "Demokratiya i perestroika," *Pravda*, October 31, 1986.

to low-level Party, trade union, and Komsomol (youth organization) posts. These innovations are clearly of considerable potential significance. Some skepticism nonetheless remains in order, for the CPSU shows as yet no sign of relinquishing its cherished right to preselect candidates to all positions of real power or influence.

Gorbachev has also called for the introduction of "self-management" in the workplace. "We want," he said during a visit to Khabarovsk in the summer of 1986, "to activate the human factor by going over to new ways of managing the economy."⁶⁸ New legislation governing the activities of state-owned enterprises was accordingly published in draft form at the beginning of 1987 and will enter into effect on January 1, 1988.⁶⁹ The new law calls for the workforce to be consulted when an enterprise director is appointed (though his or her election by the workforce is subject to approval by the enterprise's "superior organ," that is, a branch ministry or state committee); in addition, the workforce is given the power to recommend the dismissal of a manager whose performance proves unsatisfactory. The practice of allowing workers to elect their foremen and team-leaders is also being extended. A further measure to expand worker participation foresees the creation, at enterprise level, of "councils of the work collective." These councils will consist of elected representatives of the workforce, management, trade unions and Party; they are as yet still in the experimental stage.

POPULAR DISSATISFACTION WITH GORBACHEV'S POLICIES

Many members of the Soviet cultural intelligentsia have responded warmly to Gorbachev's calls for openness in public life. But what of the ordinary working man or woman, who is less interested in books and movies than in housing and food supplies? For the average citizen, Gorbachev's ascent to power has so far meant little more than fresh calls for discipline, order and hard work. For many, *glasnost'* has already gone too far and too fast. The campaign to reduce alcohol consumption is widely unpopular, as are Gorbachev's demands for a switch to multi-shift working in industry and the introduction of a new system of quality control that makes higher demands of the workforce.⁷⁰ If plans to widen wage differentials and tailor bonuses to match effort and quality of work are implemented consistently, and if state subsidies really are reduced, many shopfloor workers will find themselves out of pocket just at a moment when prices for food and other consumer goods are going up. One Soviet writer has already warned that rank-and-file workers will not willingly give up a system whereby they receive an adequate salary merely by pretending to work in exchange for a system that offers good wages only in return for hard work.⁷¹

Gorbachev has complained bitterly about the strength of resistance to his policies. Even though many Western specialists believe that the changes he plans do not yet go far enough to ensure a sus-

⁶⁸ *Radio Moscow*, July 31, 1986.

⁶⁹ *Pravda*, February 8, 1987, and July 1, 1987.

⁷⁰ The average wages of workers at an agricultural machinery plant in the Siberian city of Tyumen' were slashed by one-third when their output was rejected under the new system (*Tass*, March 4, 1987).

⁷¹ Valentin Tolstykh, "Sut' dela," *Sovetskaya kul'tura*, September 16, 1986.

tained improvement in economic growth and popular morale, it does not follow that his policies are anodyne and to everyone's liking. On the contrary, many people seem to dislike them intensely and to be putting up fierce resistance to their implementation. A leading Soviet playwright has referred to the Soviet Union's "newly discontented."⁷² Gorbachev himself asserts that such people are to be found "among workers, and peasants, and managers, and workers in the Party apparatus. . . . They are also to be found among our intelligentsia."⁷³ In short, dissatisfaction is present at virtually every level of society. In a mood of seeming despair, Gorbachev told a meeting of writers in June 1986 that "Generations will have to pass before we can really change. Generations!"⁷⁴ Popular apathy and entrenched bureaucratic interests are formidable opponents. Gorbachev himself warned a meeting of Party and government officials in Riga early in 1987 that Soviet citizens must be prepared to tighten their belts still further since the next two to three years would be a "very difficult" period, but he promised that if they did so they would see an improvement in their standard of living in the 1990s.⁷⁵ If Gorbachev failed to keep that promise, and if ordinary Soviet people found that their daily lives were not getting better, Gorbachev might find himself facing a very ugly backlash indeed.

⁷² Aleksandr Gel'man, "Chto snachala, chto potom . . .," *Literaturnaya gazeta*, September 10, 1986.

⁷³ *Moscow television*, September 18, 1986.

⁷⁴ AS No. 5785.

⁷⁵ *Moscow television*, February 19, 1987.

U.S.S.R.: TOWARD THE SERVICE ECONOMY AT A SNAIL'S PACE

By Gertrude E. Schroeder*

CONTENTS

	Page
Summary	240
I. Introduction	241
II. Allocation of resources to services	243
A. Labor	243
B. Investment	247
III. Production of services	248
IV. Services in household consumption	251
V. Prospects for the service sector	255
A. General	255
B. Plans for modernizing the service sector	256
C. Conclusions	260

TABLES

1. Employment in services in the U.S.S.R., 1950-1985	243
2. Percentage distribution of the employed labor force by sector: U.S.S.R., Japan and Italy	246
3. Percentage shares of total investment to services in the U.S.S.R., 1950-1985	247
4. Production of services in the U.S.S.R., 1950-1985	249
5. Comparison of the structure of gross domestic product by producing sector in four countries, 1970 and 1982	251
6. Services as components of consumption in the U.S.S.R., 1950-1985	252

SUMMARY

Progress toward a modern "service economy" has been slow in the Soviet Union, and the level of provision of services remains low in comparison with Western countries at comparable and even lower levels of development. This situation, now much deplored by Mikhail Gorbachev, is the consequence of a development strategy over many decades that gave priority to the production of goods and skimmed on provision of a service infrastructure. The consequent "service gap", when compared both with the situation abroad and with domestic needs, is now large and will be difficult to redress.

In 1985, the Soviet Union employed 39 percent of its labor force in the service sector, broadly defined, a share reached in Japan in 1960 and in Italy in the early 1970s; in the United States, the share was over two-thirds. Provision of trade and financial services is particularly low in comparison with the West. In the postwar

* Professor of Economics, University of Virginia.

period, the share of total investment going to services has ranged between 42 and 47 percent, small in comparison with other countries. The share has been falling since around 1960. Compared with the West, investment allocations in the U.S.S.R. are particularly low for housing and commercial services. Instead of expanding faster than GNP, as in the West, production of services in the Soviet Union has increased at about the same rate as GNP in the postwar period. Their share in GNP was 38 percent in 1985. Similarly, consumer-oriented services grew at about the same pace as total consumption, growth rates for both having slowed markedly since 1979. Household services rose considerably faster than did the communal services—education and health care. In 1982, the share of services in total consumption in the Soviet Union was below that of Greece and Portugal, countries with much lower per capita GNPs.

Gorbachev has vowed to "modernize the service sector as quickly as possible." Plans for doing so are embodied in a Comprehensive Program for Development of Consumer Goods Production and the Service Sector, 1986–2000 and in the Directives for the Twelfth Five-Year Plan. In general, the planned rates of growth are markedly higher than those achieved in the past decade. Although details are lacking, plans evidently call for a continued rise in the share of the labor force employed in the services (but not in retail trade and transportation) but little if any increase in the share of total investment allocated to the sector. Given those priorities, progress toward a modern "service economy" can continue only at a snail's pace, as it has in the past. It seems safe to predict that a backward service sector will continue to fetter production and burden the populace for the rest of this century.

I. INTRODUCTION

Modern economic growth in the West has been characterized by a fairly rapid and pronounced shift of resources from production of goods to production of services. This trend is reflected in employment and investment patterns, in the structure of national product, and in the pattern of household expenditures. Specifically, the role of agriculture—the primary sector—has fallen rapidly, that of the secondary sector—mining, manufacturing and construction—has risen, and that of the tertiary sector—services—has advanced even faster. Broadly defined, the third sector includes: services that are essential to the production of goods, such as transportation, communications, and storage; services directly benefitting the population, such as retail trade, personal services, education and health care; and general overhead services provided by government and financial institutions. In the West, the consequences, both good and bad, of the strong trend toward a "service economy", or a "post-industrial society", are the subject of a rather large literature.¹

¹ For example: Victor R. Fuchs, *The Service Economy*, New York, Columbia University Press, 1968; J. I. Gershuny and I. D. Miles, *The New Service Economy*, London, Frances Pinter Publishers, 1983; Pascal Petit, *Slow Growth and the Service Economy*, New York, St. Martin's Press, 1986; Thomas M. Stanback, Jr., *Understanding the Service Economy*, Baltimore, the Johns Hopkins University Press, 1979; Ronald Kent Shelp, *Beyond Industrialization: Ascendancy of the Global Service Economy*, New York, Praeger Publishers, 1981.

The development policies pursued by the Soviet government since the advent of central planning in 1928 have entailed the priority allocation of labor and investment resources to the industrial and construction sectors and the relative neglect of the services, except for those urgently required for transportation and distribution of goods and for provision of a skilled workforce. Put another way, the government has persistently skimmed on the allocation of resources to development of a modern urban infrastructure. Along with a secondary priority in resource allocation, development of a modern service sector has been hampered by an ideological (Marxist) bias that relegates most services to the so-called "non-productive sphere". It includes: passenger transportation, communications services purchased by the population; personal, housing and communal services; education, culture and health care; scientific, financial and government administrative services. As a consequence of relative neglect over many decades, a sizeable "service gap" has come to characterize the Soviet economy, when the provision of services there is compared with that in Western countries at similar levels of development. This phenomenon was demonstrated conclusively in Gur Ofer's meticulous investigation of the situation around 1960.² Other studies have investigated related aspects of this socialist development strategy.³ And Ofer, in concluding his study, predicted that by the 1980s the structure of the Soviet economy as regards the service sector would have "gone a good part of the way toward the normal pattern."⁴

In this paper, we use a variety of data to survey Soviet progress toward a modern service economy over the past 35 years and to provide a comparative perspective. Specifically, the paper will consider (1) allocation of labor and investment to the service sector (2) growth of services as components of production (3) role of services as components of consumption, and (4) prospects for growth of the sector and reduction of the "service gap" in the next decade. In each section, relevant international comparisons will be made. The definition of the service sector used in this paper is purposefully broad; the sector is defined to include all economic activity except that typically falling within the definition of the primary and secondary sectors given above. This treatment suits the peculiarities of Soviet practice in the classification of economic activity, as well as the available data. Such an approach also allows investigation of differential trends in a variety of tertiary sector activities that have been considered services under various definitions.

² Gur Ofer, *The Service Sector in Soviet Economic Growth: A Comparative Study*, Cambridge, Mass., Harvard University Press, 1973.

³ Paul Gregory, *Socialist and Nonsocialist Industrialization Patterns: A Comparative Appraisal*, New York, Praeger Publishers, 1970; Frederic L. Pryor, "Some Costs and Benefits of Markets: An Empirical Study," *Quarterly Journal of Economics*, February 1977, pp. 81-102, Gur Ofer, "Industrial Structure, Urbanization, and the Growth Strategy in Socialist Countries," *Quarterly Journal of Economics*, May 1976, pp. 219-244, Roger Skurski, *Soviet Marketing and Economic Development*, New York, St. Martin's Press, 1983.

⁴ Gur Ofer, *The Service Sector*. . . , op. cit., p. 165.

II. ALLOCATION OF RESOURCES TO SERVICES

A. LABOR

Continuing a long-term trend accelerated by the "leap forward" industrialization drive of the 1930s, the share of agriculture (A sector) in total employment in the U.S.S.R. has declined steadily throughout the postwar period—from 54 percent in 1950 to 24 percent in 1985. Labor released from agriculture, along with population increases, permitted rapid expansion of both the M sector (mining, manufacturing, utilities,⁵ construction) and the residual services (S sector). Whereas the share of services in total employment rose from 22 percent to 39 percent during 1951-85, their share in nonagricultural employment rose only a little—from 48 percent to 51 percent; excluding transportation and communications, the share of services rose only from 35 to 39 percent (Table 1).

TABLE 1.—EMPLOYMENT IN SERVICES IN THE U.S.S.R., 1950-1985

[Thousands of persons]

	1950	1960	1970	1980	1985
Total employment.....	80,646	95,398	118,565	136,350	139,054
Nonagricultural branches.....	37,167	55,045	81,179	100,396	105,025
Total services.....	17,750	25,464	38,930	50,823	53,819
Transportation and communications.....	4,659	7,017	9,315	11,958	12,590
Commercial services.....	3,624	4,940	7,925	10,343	10,702
Trade.....	3,360	4,675	7,537	9,694	10,020
Finance.....	264	265	388	649	682
Consumer-oriented services.....	6,922	10,499	16,569	21,648	23,337
Housing—communal.....	1,371	1,920	3,052	4,512	4,870
Health care.....	2,051	3,461	5,080	6,223	6,760
Education, culture, art.....	3,500	5,118	8,437	10,913	11,707
Science and administration.....	2,545	3,008	5,121	6,874	7,190
Science.....	714	1,763	3,238	4,379	4,530
Government administration.....	1,831	1,245	1,883	2,495	2,660
Percentage shares:					
Services share of total employment.....	22.0	26.7	32.8	37.3	38.7
Services share of non-ag. employment.....	47.8	46.3	48.0	50.6	51.2
Share of transportation and communications in total services.....	26.2	27.6	23.9	23.5	23.4
Share of commercial services in total services.....	20.4	19.4	20.4	20.4	19.9
Share of consumer-oriented services in total services.....	39.0	41.2	42.6	42.6	43.4
Share of science and administration in total services.....	14.3	11.8	13.2	13.5	13.4

Sources: Stephen Rapaw, "Civilian Employment in the U.S.S.R., 1950-1983," U.S. Department of Commerce, Bureau of the Census, CIR staff Paper, No. 10, 1985. Estimates for 1985 were made by the author of the present study, based on data in "Narkhoz" 1985, pp. 304, 391.

As shown in Table 1, all major branches of the S sector shared in the rapid growth of employment, but no dramatic changes occurred in their relative shares in total service employment. The share of transport and communications declined by 3 percentage points. The small relative gain in the share of the consumer-oriented services—education, health, and housing-communal⁶—reflects the Soviet

⁵ Soviet employment statistics classify the production and distribution of electricity in industry and the distribution of gas and water in the "housing-communal economy".

⁶ Soviet employment statistics classify only "non-productive" personal services, such as barbershops and hairdressers, in "housing-communal economy". "Productive services", such as tailoring, laundries and repair of cars and domestic appliances, are included in industrial employment.

government's policy of investing steadily in human capital and the rapid urbanization that was taking place. The share of urban population in the total increased from 39 percent in 1950 to 65 percent in 1985. A striking development is the failure of the commercial services (trade and finance) to expand their share, in view of the rapid monetization of the rural sector that was occurring, along with a more than 11-fold growth in total retail sales in real terms. Employment in financial services (banking and insurance) was about the same in 1960 as in 1950, but expanded rapidly thereafter, in order to provide a labor force for the growing network of savings banks and, more recently, for burgeoning programs to expand the sales of personal and property insurance.

A special note of clarification is required concerning trends in employment in government administration, which rose only 45 percent during 1951-1985, according to the data in Table 1. As defined there, the activity represents the Soviet statistical category "apparatus of organs of state and economic administration, organs of administration of cooperative and social organizations".⁷ The definition of this category is extremely narrow. Moreover, important groups of government-type employees such as librarians, garbage collectors, policemen, and firemen, are excluded entirely, and administrative-type employment is included under the other categories, such as education and health. While these considerations may not be crucial to analysis of the overall allocation of resources to services in the U.S.S.R., they loom large in attempts to compare the relative size of employment in government administration there with that in other countries.⁸ The rapid growth of employment in science and scientific services reflects the U.S.S.R.'s extraordinarily large commitment of resources to research and development (including military R and D) and also the fact that the vast bulk of such activity is carried out in government research institutes, rather than at production facilities, as is largely the case in the West. In 1970, for example, 86 percent of Soviet R and D personnel worked in such institutes, compared with 16 percent in the U.S.⁹

The growth of employment in the S sector was fastest during the 1960s, when it averaged 4.3 percent annually, compared with 3.6 percent annually during the 1950s. Growth slowed to 2.2 percent annually during 1971-85. In general, this pattern of growth was characteristic of all major branches of the services except transportation and communications, where employment growth was most rapid during the 1950s, when truck and bus transportation systems were being expanded from very low levels. The one-third decline in

⁷ Soviet official definitions of the branches of the economy as shown in Table 1 and elsewhere are given in USSR Gosplan, *Metodicheskiye ukazaniia k sostavleniiu gosudarstvennogo plana razvitiia narodnogo khoziaistva SSSR*, Moscow, Statistika, 1969, pp. 703-765.

⁸ Stephen Rapawy, *Comparison of U.S. and U.S.S.R. Civilian Employment in Government, 1950-1969*, U.S. Department of Commerce, Bureau of Economic Analysis, International Population Reports, Series P. 95, No. 69, April 1972. Rapawy found that where as official statistics showed "government" employment in the U.S.S.R. to be only one-seventh of that in the United States in 1969, comparable data for both countries show Soviet employment to be greater than that in the United States by either 25 percent or 57 percent, depending on which country's definition is used as a basis for comparison.

⁹ David W. Bronson, "Scientific and Engineering Manpower in the U.S.S.R. and Employment in R & D", in Joint Economic Committee, *Soviet Economic Prospects for the Seventies*, Washington, 1973, p. 581.

employment in state administration during the 1950s resulted from a shakeout of the bureaucracy that followed the death of Stalin and probably also from a reclassification of some "apparatus" workers to other sectors of the economy.

As noted earlier, a detailed study of Gur Ofer found that a sizeable "service gap" existed around 1960 between the U.S.S.R. and countries at comparable or even lower levels of development. In that study, the level of development was measured by national income per capita, percent of urban population in the total, and labor force participation rates. Ofer defined the service sector to include all economic activity except agriculture, forestry and fishing, manufacturing and mining, utilities, construction, transportation, and communications. His measure for comparison, (derived for the U.S.S.R. largely from data from the 1959 census) was the share of the labor force employed in services thus defined. According to his data, the largest divergence from expected levels occurred in the provision of commercial services, notably trade; he also found a "surprising" and large gap in the provision of government administrative services.

Because of absence of the required data and the magnitude of the task, we cannot duplicate Ofer's work for a later year. To provide an international perspective, however, comparisons are made between the Soviet Union and two countries reasonably near its level of development as measured by GNP per capita—Italy and Japan. Some comparisons also are made with the United States, by way of indicating how far the U.S.S.R. has to go before it catches up with the service economy of "the mightiest capitalist country of all", as Nikita Khrushchev once called it. For all countries, calculations of levels of GNP (GDP) per capita relative to the U.S. are available for 1975-76 based on purchasing power parities (rather than on misleading exchange rates). According to two of these studies, Soviet per capita GNP in 1976 was nearly half of the U.S. level, and per capita consumption was about one-third.¹⁰ According to another study, per capita GDP in Italy in 1976 was 54 percent of the US level and consumption was 53 percent; for Japan, the corresponding percentages were 68 and 59.¹¹ Both Italy and Japan are more urbanized than the U.S.S.R., about 70 percent in 1970, compared with 60 percent. Labor force participation rates are much higher in the U.S.S.R. than in Italy and Japan.

¹⁰ Gertrude E. Schroeder and Imogene Edwards, *Consumption in the U.S.S.R.: An International Comparison*, Joint Economic Committee, Washington, 1981, 6. Imogene Edwards, Margaret Hughes and James Noren, "U.S. and U.S.S.R.: comparisons of GNP", in Joint Economic Committee, *Soviet Economy in a Time of Change*, Washington, 1979, Vol. 1, p. 370.

¹¹ Irving B. Kravis, Alan Heston and Robert Summers, *World Product and Income: International Comparisons of Real Gross Product*, (ICP Phase III), Baltimore, The Johns Hopkins University Press, 1982, pp. 182-183.

TABLE 2.—PERCENTAGE DISTRIBUTION OF THE EMPLOYED LABOR FORCE BY SECTOR: U.S.S.R., JAPAN AND ITALY

	Agriculture, Forestry and Fishing	Mining, Manufacturing and Construction	Services
U.S.S.R.:			
1950.....	53.9	24.1	22.0
1960.....	42.5	30.8	26.7
1970.....	32.2	35.0	32.8
1980.....	26.4	36.3	37.3
Japan:			
1950.....	51.6	21.7	26.7
1960.....	32.5	27.8	39.7
1970.....	17.4	35.2	47.4
1980.....	10.4	35.3	54.3
Italy:			
1950.....	43.9	29.5	26.6
1960.....	32.6	36.0	31.4
1970.....	19.3	43.4	37.3
1980.....	14.2	37.8	48.0

Sources of underlying data: U.S.S.R.: Stephen Rapaw, "Civilian Employment in the U.S.S.R., 1950-1983," U.S. Department of Commerce, Bureau of the Census, Center for International Research, CIR Staff Paper No. 10, August 1985. Japan: Japan Statistical Yearbook, 1966, p. 54, ILO, "Yearbook of Labor Statistics," 1968, p. 289; 1975, p. 316; 1984, p. 287. Italy: ILO, "Yearbook of Labor Statistics," 1968, p. 277; 1975, p. 327; 1984, p. 304.

Data for the U.S.S.R. and Italy exclude the armed forces, whereas data for Japan include, them. For the U.S.S.R., fishing is included in manufacturing activities, as is production of electricity. Distribution of gas and electricity to the urban economy is included in services.

Comparative data on the structure of employment in the U.S.S.R., Japan and Italy are presented in Table 2. Here, the service sector is defined broadly to include all economic activity except agriculture, forestry and fishing and mining, manufacturing and construction. Although there are some minor problems of classification, the data are believed to be sufficiently comparable for the purposes at hand. As can be observed, the share of employment in services rose steadily and substantially in all three countries between 1950 and 1980—a result to be expected, since all of them were experiencing rapid economic growth and urbanization. Japan outpaced the others in the rate at which it transferred labor out of agriculture and by 1980 had over half of its labor in the S sector; Italy had nearly achieved that level. But in the Soviet Union, the share of services was about at the level attained by Italy in 1970 and Japan in 1960. (Over two-thirds of the employed labor force worked in services broadly defined, in the United States in 1980). A narrower definition of services—that used by Gur Ofer and Victor Fuchs—excludes transportation and communications from the services. Since their share is higher in the Soviet labor force, their exclusion shows the U.S.S.R. in 1980 to be well behind Italy in its progress toward a "service economy" (30 percent employed in services so defined, compared with 42 percent in Italy). Japan, with 48 percent so employed in 1980, had almost acquired the status of a "service economy", by Victor Fuchs' definition—one with over half of total employment engaged in such activities.¹² Their share had reached 62 percent in the U.S. by 1980. In Japan and Italy in 1980, employment in trade comprised almost half of total service employment, as it did in the U.S., whereas in the Soviet Union its share

¹² Victor R. Fuchs, *The Service Economy*, op. cit. p. 1.

was only one-quarter. In this respect, the U.S.S.R. resembles Portugal, which in 1980 employed 32 percent of its labor force in services but had a per capita GNP some 30 percent below that of the U.S.S.R. The relatively small allocation of workers to retail trade is an important reason for the queuing of customers that is prevalent there; some of the costs of distribution have been passed off to the population.¹³

B. INVESTMENT

The allocation of investment to the service sector in the U.S.S.R. since 1950 is depicted in Table 3, which gives the shares of several categories of services in total investment (collective farm and private investment, as well as state investment). During 1928-40, the period of the first three five-year plans, the Soviet Union allocated over half of total investment to the service sector, broadly defined, as it sought to develop an infrastructure to facilitate production and distribution for the rapidly expanding industrial sector, as well as to provide essential amenities, including schools and health facilities for the fast-growing cities. The urban population rose by about 30 million during this period. Priority was accorded to transport and communications, which received more than one-third of all investment allocated to the service sector. Since 1950, the service sector's share has been less than half of the total and has generally declined since 1960. The share devoted to transport and communications has been rising slowly. Investment in housing, the largest category, spurted during the last half of the 1950s, in response to Khrushchev's vow to "solve the housing problem" quickly by constructing more state housing and making it easier for individuals to invest in cooperative and private housing. This program quickly ran out of steam, and the share of housing in total investment has decreased markedly since 1960.

TABLE 3.—PERCENTAGE SHARES OF TOTAL INVESTMENT ALLOCATED TO SERVICES IN THE U.S.S.R., 1950-1985
[In percent]

	Housing	Transportation and communica- tions	All other services	Total services
1951-55.....	19.8	9.7	12.3	41.8
1956-60.....	23.5	9.0	14.6	47.1
1961-65.....	18.9	10.0	16.8	45.7
1966-70.....	17.7	9.5	17.7	44.9
1971-75.....	15.8	10.7	15.2	41.7
1976-80.....	14.2	11.8	15.1	41.1
1981-85.....	15.1	12.4	14.7	42.2

Source: "Narkhoz", 1980, p. 337. "Narkhoz", 1985, p. 367.

Investment in "all other services" includes allocations to trade, urban facilities, education, health, R and D, and miscellaneous other activities. Although detailed data are lacking, it appears that about one-third of the total for this category went to education and

¹³ This important point is elaborated by Pryor and by Skurski (op. cit., footnote 3).

health and about one-quarter to trade and distribution, which has claimed less than 3 percent of all investment since 1950. The rise in the share of "other services" in total investment during the 1960s in part reflects the government's decision to redress some of the huge backlog of neglect in the provision of retail trade and personal service facilities.¹⁴ The paucity of investment data provided by the Soviet government precludes a more explicit treatment of investment allocations among individual service categories.

Unfortunately, data on investment allocations are also hard to come by for Western countries. From the little information available for O.E.C.D. countries in a recent year, it appears that services tend to absorb at least two-thirds of total investment.¹⁵ They took 72 percent in Italy and 80 percent in the United States in 1980. Judging from fragmentary data, Western countries typically allocated 5 to 8 percent of total investment to trade and distribution and 8 to 13 percent to transportation. The corresponding shares in the USSR were 2.6 and 12.1. All O.E.C.D. countries devote a substantial share of investment to one of the services—housing; in 1980, for example, its share was typically 20 to 30 percent of the total. The U.S.S.R., in contrast, allocated only 13.4 percent of its investment to housing in that year, a level like that in most of Eastern Europe.

III. THE PRODUCTION OF SERVICES

Another way of gauging Soviet progress toward the "service economy" is to examine the growth of services in relation to that of total output. Such a measure is given by the data in Table 4. As used there, gross national product is measured at factor cost in 1982 prices and thus reflects resource allocations. All of the underlying growth indexes for the services represent quantity measures of some kind appropriate to the activity.¹⁶ The series for finance, education, health, and administration and miscellaneous government services are based on employment; in 1982, these categories accounted for 21 percent of total value-added in services, broadly defined. When military personnel services are included, the share rises to 25 percent. While failure to allow for productivity advance probably understates growth in such activities relative to other sectors, the problem of devising suitable indicators of productivity in the service industries is common to measurement of GNP everywhere. In the Soviet case, the use of possible alternative methodologies is constrained by the paucity of data and by obscurities in definitions and methods of compilation.

¹⁴ The backward state of provision of retail trade and personal service facilities in urban areas is described in Gertrude E. Schroeder, "Retail Trade and Personal Services in Soviet Cities", in Henry W. Morton and Robert C. Stuart (editors), *The Contemporary Soviet City*, Amonk, N.Y., M.E. Sharpe, 1984, pp. 202-220.

¹⁵ These investment shares were calculated from national accounts data. O.E.C.D., *National Accounts, 1971-1983*, Volume II, Paris, 1985.

¹⁶ A detailed description of the nature and derivation of the indexes underlying the growth rates given in Table 4 and in the text is provided in U.S.S.R.: *Measures of Economic Growth and Development, 1950-80*, Joint Economic Committee, Washington, 1982.

TABLE 4.—PRODUCTION OF SERVICES IN THE U.S.S.R., 1950–1985

	1951-60	1961-70	1971-80	1981-85	
Average annual rates of growth:					
Gross national product	5.1	5.0	2.6	2.0	
Total services	4.3	5.5	3.6	2.1	
Transportation and communications	11.9	8.6	5.1	2.5	
All other services	3.2	4.6	3.1	2.0	
Commercial services ¹	8.5	6.0	3.7	1.6	
Consumer-oriented services	4.3	4.4	2.8	2.5	
Housing and utilities	4.3	4.1	2.9	3.1	
Other household services ²	6.9	5.4	4.1	3.1	
Health and education	3.5	4.4	2.1	1.5	
Administration and miscellaneous government services ³	-2.4	3.7	2.6	1.0	
Science and scientific services	9.6	7.6	4.7	1.6	
	1950	1960	1970	1980	1985
Percentage shares in gross national product:					
Total services	35.5	32.8	34.4	37.7	38.1
Transportation and Communications	3.2	6.0	8.4	10.6	10.9
All other services	32.3	26.8	26.0	27.1	27.2
Commercial services	4.2	5.7	6.3	7.0	6.9
Consumer-oriented services	15.3	14.1	13.4	13.5	13.9
Housing and utilities	6.7	6.2	5.8	5.9	6.1
Other household services	1.8	2.1	2.2	2.5	2.7
Health and education	6.8	5.8	5.5	5.2	5.1
Administration and miscellaneous government services	12.0	5.7	4.6	4.6	4.4
Military personnel	5.8	2.7	2.2	2.0	1.9
Science and scientific services	0.8	1.3	1.7	2.0	2.0

¹ Includes trade and finance.² Includes repair and personal care services and recreation.³ Includes military personnel.

Source: Growth rates and shares were calculated from indexes of real GNP by sector of origin at factor cost in 1982 prices weights, as described in the paper by Laurie Kurtzweg in volume 1 of this compendium. The use of factor cost weights attempts to correct for the distortions in Soviet prices stemming from pervasive taxes and subsidies and the failure of profits to reflect accurately the returns to capital.

Over the past 35 years, the production of services expanded at approximately the same rate as total output, but much more rapidly during the 1950s and 1960s than in later years. Overall, services increased nearly fourfold, and their share in total output rose slightly—36 to 38 percent. The most notable gains were made in transportation and communications, which expanded 11 times and increased their share in total services output from 3 percent to nearly 11 percent. This rapid advance is accounted for to a considerable extent by the development of several activities from near-zero levels in 1950—truck, bus, air and pipeline transport, and radio and television broadcasting.

Services other than transport and communications failed to keep pace with the growth of total output, and their share dropped over the period from 32 percent to 27 percent. There was much variation in growth among those services, however. Commercial services far outpaced the rest of such services, notably trade. The trade category includes wholesale and retail trade, industrial supply, and state procurement of agricultural products. Gains were particularly fast during the 1950s reflecting rapid growth in the volume of both producer goods and consumer goods handled in the trade network as well as the shift of a large share of farm household consumption in kind of food to purchases in retail markets. According to a

Soviet source, the share of consumption in kind in total "personal" consumption fell from over 15 percent in 1950 to about 8 percent in 1973.¹⁷ Financial services, as measured by employment, stagnated until 1965, but have expanded more rapidly than GNP since then. As might be expected for a state-owned and managed economy without capital markets, financial services are narrow in scope, consisting solely of the activities of a network of commercial, savings, and specialized banks and the state insurance agency, Gosstrakh.

In contrast to commercial services, the group of consumer-oriented services expanded much less rapidly than total output in the postwar period. Health, education, and housing services were the slowest growing of the group. The relatively fast growth of utilities, repair and personal care, and recreation services reflects the government's decision to give some attention to these sectors, which had been virtually ignored under Stalin.

According to the data shown in Table 4, administration and miscellaneous government services grew very slowly indeed over the past 25 years. The coverage of this series, which is broader than that of the employment series "apparat" given in Table 1, represents an attempt to group together and account for services that typically would be classified as government activity in other countries. Besides the services that Soviet statisticians label "administration", the series includes: civilian police and firemen; forestry services; libraries, museums, parks, and the like; government agricultural services; and municipal services such as sanitation and upkeep of streets. It also includes military personnel services: their inclusion adds 75 percent to the value of government services in 1982, but somewhat reduces the growth rate for the category. The measure of growth is based on employment in these activities; some of the series had to be estimated by rough and ready methods, notably civilian police, firemen and municipal service workers, since data are not published for these groups. Nonetheless, the slow growth of this category of services testifies to the Soviet government's policy of minimizing resource allocations to such "non-productive" activities and also to its penchant for concealing their true size and growth by transferring their costs to the populace and to other sectors of the economy.¹⁸ Comment has already been made concerning the fast growth of scientific services. One should note that a substantial part of such R and D would not be treated as final activity in the economic accounts of Western countries, but rather as an intermediate input charged to the costs of final products.

To give an international perspective, Table 5 provides data on the structures of national product by producing sector for the Soviet Union, Italy, Japan, and the United States in 1970 and 1982. As is evident, by this measure, too, a sizeable "service gap" existed between the U.S.S.R. and the other countries in 1970, and it was even larger in 1982. A notable divergence is in trade, where the share in total GNP in the U.S.S.R. is only about half of the corre-

¹⁷ R.A. Lokshin, *Spros proizvodstvo, torgovlia*, Moscow, Ekonomika, 1975, p. 9.

¹⁸ For elaboration of these points, see Gertrude E. Schoeder, "A Critique of Soviet Statistics on Public Administration", *ACES Bulletin*, Spring 1976, pp. 23-44.

sponding shares in the other countries. These results accord with the findings of other studies, which have demonstrated sizeable underallocation of resources to the trade sector in the Soviet Union relative to the West. They also corroborate the impressions of visitors that, at least in the area of retail trade, the U.S.S.R. may well be the world's most underdeveloped "developed" country. An even greater and growing gap is to be found in the provision of financial and real estate services. An important component of the gap is that associated with the niggardly provision of housing. Another reason is the absence of capital markets in the U.S.S.R. In contrast, the Soviet Union outpaces the other countries in resource allocations to transportation and communications, a result to be expected, given that country's vast geographical expanse and the location of natural resources relative to population. The remaining services, mainly education and health and personal services, could not be disaggregated readily for the Western countries. However, one would probably find that relatively the most developed of these services in the U.S.S.R. was education. Although a significant "public administration" gap might appear, as Ofer concluded, the gap would be reduced considerably (perhaps eliminated), if all such outlays in the U.S.S.R. could be properly accounted for in the statistics.

TABLE 5.—COMPARISON OF THE STRUCTURE OF GROSS DOMESTIC PRODUCT BY PRODUCING SECTOR IN FOUR COUNTRIES, 1970 AND 1982

	U.S.S.R.		Italy		Japan		United States	
	1970	1982	1970	1982	1970	1982	1970	1982
Total gross domestic product	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture, forestry, and fishing	21.0	20.2	8.2	5.8	6.1	3.4	2.7	2.6
Mining, manufacturing, construction and utilities	39.3	42.6	42.9	40.6	46.6	42.6	34.8	32.1
Services ²	39.6	37.2	48.9	53.6	47.3	54.0	62.5	65.3
Transportation, communications and storage	9.6	10.8	6.2	6.2	6.2	6.9	6.4	6.4
Wholesale and retail trade	7.3	6.5	15.3	15.7	14.0	12.3	17.4	16.7
Finance, insurance, and real estate (including housing)	7.6	5.1	16.7	18.4	11.6	16.0	18.3	21.7
All other services	15.1	14.8	10.7	13.3	15.5	18.8	20.4	20.5

¹ In this table, services include military personnel services. The data for the U.S.S.R. also include the supplying of gas and water to the urban sector.

Sources: U.S.S.R.: Derived from GNP by sector of origin at current factor cost as given in U.S. Congress Joint Economic Committee, "USSR: Measures of Economic Growth and Development, 1950-80," Washington, 1982, p. 61 and that underlie the paper by Laurie Kurzweg in volume 1 of this compendium. Others: O.E.C.D., "National Accounts, 1964-1981," Volume II, pp. 20, 32, 46, 76, 144, 313.

IV. SERVICES IN HOUSEHOLD CONSUMPTION

Services provided to the population increased at an average annual rate of 4.4 percent during 1951-1985, about the same as total consumption. On a per capita basis, the gains averaged 3.1 percent per year. The relevant data are given in Table 6, where the measures are presented in established prices, because our concern here is with real consumption by the population, not with the allocation of resources. The data include both state and privately provided services; in the base year 1982, the latter were estimated at 9 billion rubles, 12 percent of the total. Services grew somewhat more slowly than total consumption during the 1950s, as the gov-

ernment accorded priority to improving the quality of the population's diet and to launching a durable goods industry from a near-zero level. Thereafter, the supply of services increased more rapidly than supplies of goods. Household services as a group increased faster than communal services (health and education), bringing their share in total consumption from 8 percent in 1950 to 12 percent in 1985. Among the household services, by far the most rapidly growing were personal transportation (public facilities, not privately-owned vehicles), communications, and utilities (gas, electricity and central heating, focused on state-owned housing). The stock of housing increased much more slowly than consumption as a whole—at an average annual rate of 3.2 percent. This gain reflects an increase in urban housing space per capita of nearly 5 square meters, bringing urban living space per capita to 9.5 square meters in 1985—not much above the 9 square meters regarded by Soviet planners as the "minimum standard for health and decency". Despite a significant reduction in urban crowding in recent years, one-fifth of urban families still must share kitchen and bath facilities, and housing conditions remain a source of great dissatisfaction for many Russians.¹⁹ Rural residents enjoy somewhat more space but fewer amenities than their urban counterparts.

TABLE 6.—SERVICES AS COMPONENTS OF CONSUMPTION IN THE U.S.S.R., 1950–1985

	1951-60	1961-70	1971-80	1981-85
Average annual rates of growth:				
Total consumption.....	6.1	5.2	3.3	1.6
Total services.....	5.1	5.7	3.4	2.4
Household services.....	6.3	6.8	4.6	3.3
Housing and utilities.....	4.6	5.2	3.8	3.4
Transportation and communications.....	10.9	9.6	5.3	2.8
Repair and personal care.....	4.8	7.0	5.2	4.0
Recreation.....	10.3	4.4	3.6	1.9
Communal services.....	4.4	4.9	2.2	1.5
Education.....	3.4	5.5	2.3	1.5
Health.....	5.9	4.1	2.1	1.5

	1950	1960	1970	1980	1985
Percentage shares:					
Total consumption.....	100.0	100.0	100.0	100.0	100.0
Total services.....	21.6	19.7	20.6	20.8	21.8
Household services.....	7.9	8.1	9.3	10.6	11.7
Housing and utilities.....	3.5	3.0	3.0	3.2	3.5
Transportation and communications.....	1.2	1.9	2.8	3.4	3.6
Repair and personal care.....	2.6	2.3	2.8	3.3	3.7
Recreation and entertainment.....	0.6	0.9	0.8	0.8	0.8
Communal services.....	13.7	11.6	11.3	10.2	10.1
Education.....	8.8	6.8	7.0	6.4	6.3
Health.....	4.9	4.8	4.3	3.8	3.8

Sources: Growth and shares were calculated from indexes of real consumption with weights in 1982 established prices as described in the paper by Laurie Kurtzweg in volume 1 of this compendium.

¹⁹ See the paper by Michael Alexeev in this volume.

Repair and personal care services—termed “everyday services” in Soviet literature—rose four-fold on a per capita basis during the period under review. While this gain may seem impressive, these services were miniscule in 1950 and were nearly all provided privately. Beginning around 1960, the government decided to expand the state sector rapidly by setting up tens of thousands of small state enterprises. Although the value of state-provided everyday services increased from 1.0 billion rubles in 1960 to 10.4 billion rubles in 1985, about 20 percent represents sales to state enterprises and a significant part consists of goods manufactured in small lots, such as clothing, shoes and furniture. Judging from press reporting, moreover, state services are grossly deficient relative to demand, both in quantity and quality. Private individuals help to fill the gap—by supplying some 5-6 billion rubles of assorted services in recent years, according to a Soviet source.²⁰ Services for recreation and entertainment reflect mainly attendance at state-run movies, theaters, circuses, and vacation facilities. These services expanded rapidly during the 1950s and 1960s, but very slowly since then on a per capita basis. Evidently, the advent of television and the private automobile has curtailed demand for such public services in recent years in the Soviet Union, as elsewhere.

During 1951-85, the communal services—education and health—increased less rapidly than consumption of goods and personal services. During 1928-1950, in contrast, while household consumption per capita increased by only about 10 percent, communal services per capita rose by nearly 350 percent, as the government instituted a system of universal health care and expanded educational facilities—both key parts of its program to upgrade the quality of the labor force as rapidly as possible. In 1982, these services, including tutoring and health care provided by private individuals, comprised 5.4 percent of GNP. While the share going to education compares favorably with shares in Western Europe, the share for health (2 percent) is low even in comparison with LDCs. The Soviet government persistently has sought to keep the costs of both programs low by paying relatively low wages, especially in health care, and by restricting access to higher education. The quality of Soviet health care is abysmal by Western standards, unequally distributed and the subject of much recent complaint in the Soviet press.²¹ In real terms, both education and health services have decreased as shares of total services, as well as of consumption and GNP since 1950.

Another way of looking at the service sector is to examine the distribution of family expenditures over time as money incomes have risen. According to the best available estimates, per capita annual disposable money incomes increased sixfold during 1951-1985, an average annual rate of 5.2 percent.²² The Soviet government publishes data on family expenditures in current prices obtained through periodic family budget surveys. Although these sur-

²⁰ *Izvestiia*, August 19, 1985.

²¹ *Washington Post*, November 8, 1986. Also, see the paper by Christopher Davis in this volume.

²² This estimate is an updating of data given in M. Elizabeth Denton, “Soviet Consumer Policy: Trends and Prospects,” in *Soviet Economy in a Time of Change*, Joint Economic Committee, Washington, DC, 1987, vol. 1, pp. 785-789.

veys have been faulted on many counts by both Western and Soviet economists, they are the only ones available that pertain to major groups of the population in the country as a whole. The results are published in percentage breakdowns of the incomes and expenditures for a sample of families of industrial workers and also of families of collective farmers.²³ In general, they reveal the expected changes in patterns of expenditures with rising incomes. Reflecting Engel's "law", the share of food in total expenditures dropped markedly throughout the period for both groups of families. The share of services has risen steadily, but largely because of the expansion of communal services. As might be expected, the shift in expenditure patterns has been most marked for collective farm families, since state policies have achieved rapid reduction in income differentials between agricultural and non-agricultural workers in the post-Stalin period.

Nonetheless, the share of services in the consumption of Soviet families is low by international standards. In 1982, services made up a little over one-fifth of total consumption expenditures in the U.S.S.R., with purchases of goods, including food and beverages bought in hotels and restaurants, making up the remainder. In 1976, the share of services was 20.4 percent, compared with 54.8 percent in the United States; private as well as government current expenditures are included in both countries.²⁴ In 1975, the share of services in total consumption was 32 percent in Yugoslavia, around 20 percent in Romania, 24 percent in Poland and 27 percent in Hungary.²⁵

In addition, using a somewhat different concept, data can be compiled for 11 O.E.C.D. countries in 1982 giving private expenditures on goods and services and government current outlays on education and health.²⁶ Here, following O.E.C.D. practice, the definition of services includes all expenditures on food and beverages in hotels and restaurants. The shares of services in total consumption so defined range from 30 percent for Portugal to 54 percent for the United States and Japan. The share was 33 percent for Greece and 40 percent for Italy. It was about 28 percent in the U.S.S.R. on a comparable basis.

Part of the explanation for the low share of services in total consumption expenditures in the Soviet Union relative to the West stems from the fact that their prices are lower relative to the prices of goods in the U.S.S.R. than they are in Western price structures. The main reason, however, is the low quantity of services provided in the U.S.S.R. compared with that in most Western countries.²⁷ Of course, the categories of goods and services are not

²³ Narkhoz 1985, pp. 417-419.

²⁴ Gertrude E. Schroeder and Imogene Edwards, op. cit., p. 13.

²⁵ Irving B. Kravis, Alan Heston and Robert Summers, op. cit. p. 13. The shares of services were calculated from data given in Tables 6.1, pp. 164-67 and Appendix Table 6.1, pp. 200-207.

²⁶ O.E.C.D., *National Accounts, 1971-1983*, Vol. II, Paris 1985.

²⁷ This conclusion is shown in the results of the quantitative comparison of Soviet and U.S. consumption per capita in 1976, where the Soviet Union is shown to look better relative to the U.S. in consumption of goods than in consumption of services, particularly household services. Gertrude E. Schroeder and Imogene Edwards, op. cit., p. 6. In the U.S.S.R., the prices of services are heavily subsidized. When they are revalued to reflect their resource costs, their share in total consumption in 1982 rises from 21 percent to 34 percent. See also: Gertrude E. Schroeder, "Soviet Living Standards in Comparative Perspective," in Horst Herlemann (editor), *The Quality of Life in the Soviet Union*, Boulder, Colorado, Westview Press, 1987, pp. 13-30.

entirely independent. Because the Soviet Union provides its population with far fewer consumer durables per capita than do other industrialized countries both East and West, there is correspondingly less need to supply the related services. International comparisons of consumption per capita, tenuous though they are, generally show the Soviet Union to lag badly behind the West in provision of household services, to compare somewhat more favorably with respect to health care, and to exceed the West (except for the United States) in provision of education.

V. PROSPECTS FOR THE SERVICE SECTOR

A. GENERAL

Rapid development of the backward service sector of the Soviet economy is essential to the success of Gorbachev's industrial modernization program, in particular, and to his long-run ambition to have the Soviet Union catch up with modern Western societies, in general. A developed services sector is a key to the efficient production of goods, for inadequate transportation, communications, distribution and storage facilities can become fetters on production, as recent experience has shown.²⁸ In the consumer sector, a healthy service sector is essential to good worker morale and to the efficacy of monetary incentives. To get the nation's consumer-workers to respond with greater work effort to higher wages and appeals for discipline, the government must radically upgrade the quantity and quality of services for the population, which has made abundantly clear its acute dissatisfaction with the present state of affairs. More trade and personal services are needed in order to reduce the waste of workers' time in queuing and unnecessary absenteeism. In addition, efforts to increase the supply of consumer durables will not produce the desired results unless a flow of related services is also provided.

Modernization of the service sector presents formidable challenges. As a consequence of decades of relative neglect, Gorbachev has inherited: (1) a transportation network stretched tight and accident prone, as events of 1979, 1982 and 1985 revealed, and a road network that can only be described as archaic by modern standards; (2) a telephone system so backward that in 1985 only 23 percent of urban families and 7 percent of those in rural areas had private telephones;²⁹ (3) a retail network employing backward technology, inefficient sales procedures and too few workers, and also having too few outlets; (4) repair and personal care facilities that are too few in quantity, poor in quality and the source of burgeoning illegal private activity to help fill the gap; (5) poorly maintained and crowded housing that barely meets state-set minimum standards for health and decency; (6) a universal system of health care, whose poor quality and inadequacy are now being publicly blamed for endemic public health problems and unfavorable mor-

²⁸ Transportation bottlenecks, for example, contributed significantly to poor industrial performance during 1976-82. See Gertrude E. Schroeder, "The Slowdown in Soviet Industry", *Soviet Economy*, Vol. 1, No. 1, pp. 1-30. Inadequate transport and storage facilities have long contributed to gross waste in agriculture. See the paper by Judith Flynn and Barbara Severin in this volume.

²⁹ *Pravda*, September 26, 1985.

tality rates;³⁰ (7) an educational system that has probably oversupplied graduates relative to the ability of the economy to use them productively and failed to correctly match training with the economy's changing requirements. Over the past decade or so, the ills of the service sector have become an active area of investigation and prescription by Soviet economists. By their own admission, the sector is whofully backward, even by Soviet standards. Thus, Soviet sources, writing in 1985 and 1986, state that a mere 2 percent of the total family budget is spent on "everyday" services and only 40 percent of the demand is being met³¹ and that the share must more than double in order to meet the standards of a "rational" budget.³² A leading consumption specialist states that the share of all paid services in the population's total money expenditures actually fell between 1970 and 1983, that the level of paid services was only 27 percent of the rational norm, and that private persons supply 12-14 billion rubles of such services due to the deficiencies of the state sector.³³ A Gosplan specialist states that outlays on paid services made up only one-tenth of the population's money expenditures, "obviously too little" and excoriates the planners for having failed to take into account sufficiently the population's manifest preference for relatively more services as incomes rose.³⁴ A retail trade specialist states that in 1985 per capita retail floor space was only 89 percent of the rational norm.³⁵ According to another writer, to reach the rational standards newly worked out for consumption of paid services, employment in the activity would need to nearly double and their volume would need to triple.³⁶

In this speech to the 27th Party Congress, Gorbachev singled out as one of the "basic social tasks" the "development of a modern service sector as quickly as possible".³⁷ He called for "decisive measures" to eliminate the marked imbalance between the supply and demand for services, particularly those for maintenance of housing, car repair and tourism. He also suggested that cooperative forms of organization might be suitable for developing consumer services, housing and trade. In a later speech to the Party aktiv in Khabarovsk Kray, he said, "It is necessary firmly to put an end to the attitude that the service sector is somehow secondary or supplemental."³⁸

B. PLANS FOR ACHIEVING A MODERN SERVICE SECTOR³⁹

The planned approach to accelerated development of the service sector is spelled out in unusually great detail in a "Comprehensive

³⁰ See the paper by Christopher Davis in this volume.

³¹ *Pravda*, June 14, 1986.

³² *Ekonomicheskie nauki*, No. 10, 1985, p. 15.

³³ *Izvestiia Akademii Nauk, seriia ekonomicheskaiia*, No. 3, 1986, p. 77-78.

³⁴ *Ekonomicheskaiia gazeta*, No. 34, August 1986, p. 2.

³⁵ *Sovetskaia torgovlia*, No. 6, 1986, p. 9.

³⁶ *Kommunist*, No. 1, 1986, p. 38.

³⁷ *Pravda*, February 26, 1986.

³⁸ *Pravda*, August 2, 1986.

³⁹ I omit here a discussion of plans and prospects for developing freight transportation services and transport facilities to service agriculture, since these topics are treated in detail in other papers in this volume.

Program for the Development of Consumer Goods Production and the Service Sector for the Years 1986-2000", published in October 1985,⁴⁰ and specific targets were set in the "Basic Guidelines for the Economic and Social Development of the U.S.S.R." covering the same period.⁴¹ Except for a sharp increase in the growth rate planned for total paid services, these goals apparently were incorporated without major change in the Law on the Plan for 1986-1990 that was adopted by the Supreme Soviet in June 1986.⁴² This program contains much that is old and several approaches that are new. Above all, the program and the several related decrees issued in 1985 and 1986 reveal a strategy of coupling promises of large gains across the board with a determination to allocate a minimum of additional resources to the effort to fulfill such promises.

As in previous 5-year plans, the Comprehensive Program and the Twelfth 5-Year Plan set ambitious targets for growth in the quantity of services of various kinds and schedule large improvements in their quality. The targets set for 1986-90 are uniformly high when compared with the experience of the past decade, as can be seen in the tabulation below.

Type of service and unit of measure	1976-80 ¹	1981-85 ¹	Plan	
			1986-90 ²	1986-2000
Total paid services ³ —average annual percentage growth.....	3.7	3.2	8.4	5.1-5.7
Personal transportation—same.....	7.4	5.7	7.0	6.0-6.3
Personal communications—same.....	4.7	3.8	5.4-6.2	6.8-7.6
Retail sales, less alcoholic beverages—same.....	4.2	4.0	5.9	NA
Housing and municipal services—same.....	3.5	3.4	5.7-6.0	5.4-6.0
Housing built—million m ²	527	552	4 595	NA
Nurseries and kindergartens—million places.....	2.9	2.9	4.4	NA
General education schools—same.....	6.7	5.2	7.2	NA
Hospital services—thousand beds.....	324	318	4 358	NA

¹ Except for retail sales, percentage growth rates are based on CIA indexes. Physical measures are given in "Narkhoz" 1985, pp. 420, 431, 434, 435. Retail sales growth rates were calculated from indexes given in "Narkhoz" 1985, p. 459.

² In the final Law on the Plan adopted in June 1986, the growth of total paid services was set at 50 percent, compared with the target of 30-40 percent set in the Comprehensive Programs and in the Plan Directives approved by the 27th Party Congress. Targets for specific kinds of services also must have been raised sharply. Plan targets for 1986-2000 are those given in the Comprehensive Program.

³ Includes all services paid for by the population directly; the coverage of the CIA indexes is somewhat narrower.

⁴ In 1987, the target was raised to 630 million square meters.

As part of a heightened emphasis on financial planning, a new concept—total services paid for by the population from personal income—has been established as a centrally-set plan target beginning in 1986. This category, amounting to 44.8 billion rubles in 1985,⁴³ includes: housing-communal services, personal transportation and communications, all repair and personal care or "everyday" (bytovye) services, recreation, fee-paid health clinics, child care and educational fees, legal and financial services, and some unspecified others. Besides the attention given to it in the Comprehensive Program, the Twelfth Five-year Plan and Party leaders' speeches, the service sector, including retail trade, has been the subject of a number of special decrees. Thus, a Council of Ministers Decree requires that all enterprises and organizations throughout

⁴⁰ *Sotsialisticheskaya industriia*, October 9, 1985.

⁴¹ *Pravda*, March 9, 1986.

⁴² *Izvestiia*, June 20, 1986.

⁴³ *Narkhoz* 1985, p. 488.

the economy be given mandatory targets for providing services of some kind to their workers and wherever feasible to the general public.⁴⁴ Decrees of March and September 1985⁴⁵ and August 1986⁴⁶ deal with improving retail trade facilities and reforming planning procedures and incentives in that sector; resolutions adopted in July 1985⁴⁷ and April 1986⁴⁸ deal with housing and municipal services; a resolution adopted in early 1985 called for radically upgrading telephone services.⁴⁹ A Party-government resolution issued in August 1986 considerably expanded the responsibilities and authority of local Soviets in matters relating to the population's welfare and the development of social infrastructure (without, it seems, providing additional resources).⁵⁰ Finally, following a period of experimentation, a general reform of planning and incentives similar to that being adopted elsewhere took effect in enterprises of the Republic Ministries of Consumer Services in 1986.⁵¹ And the new law on individual economic activity, adopted by the Supreme Soviet in November 1986, sanctions a wide range of small-scale, individual and family ventures in handicrafts and services.⁵² A politburo decision in August 1986 supported the establishment of producer cooperatives "oriented primarily toward more fully satisfying public demand for consumer and household service of various kinds."⁵³ Finally, the machinery-producing ministries have been directed to set up factory retail outlets that will sell and service consumer durables produced by the factory.⁵⁴

Carrying out a grandiose crash program to upgrade the state services sector of the kind now being touted will require substantial additions of both capital and labor. Although the announced figures for planned investment during 1986-90 are inconsistent and confusing,⁵⁵ it would appear that no significant re-direction of investment toward the service sector is being planned, given the large increments in investment planned for the energy, machinery and chemicals branches. The rhetoric over the services program makes it clear that much reliance is being put on a "do-it-yourself" approach. Enterprises, organizations and local Soviets are being pressured to use internally-generated incentive and other funds for investing in more services and to tap "local reserves" that might be made available through above-plan economies of one kind or another. However, whatever local funds may be thus generated, they must compete with other claimants for labor, scarce materials, equipment and construction services. Indeed, enterprises are being told to build new social facilities using their own workers.

Availability of labor will seriously constrain the expansion of the service sector, which is quite labor-intensive. During the Twelfth Five-year Plan the total labor force will expand only by some 4.2

⁴⁴ *Izvestiia*, September 21, 1985.

⁴⁵ *Pravda*, April 14 and September 21, 1985.

⁴⁶ *Pravda*, August 31, 1986.

⁴⁷ *Pravda*, July 7, 1985.

⁴⁸ *Pravda*, April 17, 1986.

⁴⁹ *Izvestiia*, March 3, 1985.

⁵⁰ *Pravda*, July 30, 1986.

⁵¹ *Ekonomicheskaiia gazeta*, No. 32, August 1985, pp. 11-14.

⁵² *Pravda*, November 21, 1986.

⁵³ *Pravda*, August 16, 1986.

⁵⁴ *Izvestiia*, December 15, 1986.

⁵⁵ See the paper by Robert Leggett in volume 1 of these selected papers.

million people. Stated goals for productivity gains during this period imply that employment in the "productive" (material) sectors as a whole will not increase; it is planned to decrease in agriculture. Thus, by implication, all of the additional labor is supposed to be employed in the "non-productive" (service) sector. As a Soviet economist has pointed out, however, getting people to work in the relatively low paid, low-prestige services will be difficult. According to his calculation, the average wage in the non-material branches (services) is 30 percent below that in the branches of material production.⁵⁶ To cope with the pay problem, plans call for substantial increases in wages in education, health and culture. Curiously, no increase in employment in retail trade is scheduled, despite a substantial planned addition to retail trade floorspace.⁵⁷

Along with vigorous expansion of the state sector, Gorbachev evidently is counting on help from private initiatives. The actions taken thus far, however, are cautious and even contradictory. Although the law on individual labor activity adopted in November 1986 has been hailed as a milestone, it sanctions little that is not now already legal. The most important additions are private rental of rooms and private taxi service. The law is to take effect on May 1, 1987, thus allowing time for the authorities to draft the rules and regulations that are to govern private activity, including rates of taxation, license fees, prices and many other matters. The law forbids hired labor and makes it clear that individuals with a job do not have the option of quitting and starting up a private endeavor. Rather, they may engage in private activity only in their spare time. Although the Politburo has approved a set of principles governing establishment of cooperatives to supply services,⁵⁸ the details have not yet been published. Whether the new rules will produce an upsurge in labor activity remains to be seen. The law on individual economic activity was adopted a few months after the launching of a vigorous campaign, with appropriate legislation,⁵⁹ to root out corruption and illegal private provision of goods and services and in the midst of a lively debate over "unearned income" and "social justice". Although the potential for improvement could be considerable, the long run effects of sanctioning private and cooperative endeavors in the service sector will depend on the nature and extent of state regulation and on the general political-ideological climate in which they will function.

A variety of other proposals are being aired for improving the situation in the state service sector. The use of the price mechanism more vigorously is involved in suggestions to introduce higher rates for better quality housing or for space above a state-set minimum; to raise urban transport charges so as to reduce subsidies; to expand the network of the fee-paying health care clinics; to raise prices for concerts and theater tickets so as to reduce subsidies.⁶⁰ To help with the labor problems, local authorities are being urged to seek out more pensioners, part time workers and people who

⁵⁶ *Sovetskaia kul'tura*, January 4, 1986.

⁵⁷ *Sovetskaia torgovlia*, No. 6, 1986, pp. 9.

⁵⁸ *Vedomosti Verkhovnogo Soveta SSSR*, No. 22, May 1986, pp. 369-373.

⁵⁹ *Pravda*, August 16, 1986.

⁶⁰ See for example: *Izvestia*, August 9, 1985; *Sovetskaia Rossiia*, August 16, 1985; *Pravda*, December 19, 1985; *Kommunist*, No. 1, 1986, pp. 31-40; *Voprosy ekonomiki*, No. 7, 1986, pp. 85-95.

wish to work overtime or at home. Also, a major educational effort is being urged to combat "negative attitudes" toward work in service industries.

C. CONCLUSIONS

Clearly, Mikhail Gorbachev wants to achieve a "Great Leap Forward" in the pace of modernization of the Soviet economy and society by the end of the century. Given the resource constraints that he faces and the unlikelihood of a dramatic breakthrough in productivity, modernization is likely to proceed quite slowly, as it has in the past 35 years. Despite his assertion that there are no secondary priority sectors, Gorbachev's top priority clearly is to modernize the industrial sector and its capital stock as quickly as possible. The investment resources needed for the task and to support continued growth in energy supply and a high-cost agriculture will make it impossible to boost the share of investment allocated to the service sector to the level that would be required to overcome quickly the legacies of decades of relative neglect. Without such a major change in investment priorities, progress toward a modern service economy can be made only at a snail's pace, as in the past. Moreover, because the modern service economy, as it has developed in the West, has an insatiable appetite for labor, progress in the Soviet Union will necessarily be severely constrained by slow growth in the total labor force and, in the absence of a productivity miracle, by the inordinately large use of labor in agriculture. It seems safe to predict that the share of the labor force engaged in services (broadly defined) in the Soviet Union in 1990 will at best resemble that attained in Japan in the late 1960s and in Italy in the late 1970s. The "gap" with the West in the provision of commercial services will continue to widen, since even Soviet plans do not call for additional workers in that sector (at least in retail trade). Thus, an underdeveloped service economy will continue to fetter production and burden the populace, for the rest of this century.

GORBACHEV'S POLICY ON THE PRIVATE SECTOR: TWO STEPS FORWARD, ONE STEP BACKWARD

By Roger Blough, Jennifer Muratore, and Steve Berk*

CONTENTS

	Page
I. Summary.....	261
II. Introduction.....	262
III. Controversial Proposals.....	262
IV. The Regime's Response.....	264
A. The Law on Self-Employment.....	264
B. Regulations on Forming Cooperatives.....	265
C. The Crackdown on "Unearned Income".....	265
D. Regulations on "Shabashniki".....	265
V. The Difficulty of Balancing Objectives.....	266
VI. Conflicting Interpretations.....	267
VII. A Key Role for Local Authorities.....	268
VIII. A Poor Beginning.....	269
IX. Outlook.....	270

I. SUMMARY

Approval of a series of legislative initiatives since the 27th Party Congress in March 1986 suggests that the Gorbachev regime is embarking on a cautious expansion of opportunities for individual, family, and small group businesses in the USSR.¹ This new legislation has affirmed the legality of so-called "individual labor activity" and fostered the establishment of member-run cooperatives. To ensure that labor is not diverted from the state sector, the new measures limit participation mainly to students, homemakers, and pensioners. Despite these restrictions, the legislation constitutes one of the regime's most controversial reform steps so far and reflects Gorbachev's willingness to confront past economic orthodoxy in an effort to improve consumer welfare.

Proponents of this legislation hope it can give a boost to the Soviet consumer by expanding the range and improving the quality of available goods and services. Many of them may also hope that creating a more favorable climate for legal private businesses will induce private entrepreneurs currently operating underground to come out into the open, and that this will enable the regime to regulate the private sector more effectively.

The new laws were preceded by decrees on "unearned income," aimed at tightening law enforcement against operators in the ille-

* Office of Soviet Analysis, Central Intelligence Agency.

¹ *Pravda*, 21 November 1986; *Sobraniye Postanovleniy Pravitelstva Soyuza Sovetskikh Sotsialisticheskikh Respublik (Otdel Perviy)*, no. 23, 1986, pp. 399-402; and *Izvestiya*, 13 February, 1987.

gal "second economy".² Some advocates of an expanded legal private sector see the crackdown on "unearned income" as complementing the individual labor activity legislation. But some conservative officials, perhaps including party secretary Ligachev, have tried to use the "unearned income" decrees to discourage private activity across the board.

Thus far the development of legalized businesses is proceeding slowly. Local authorities have often used their powers to frustrate the efforts of those who wish to start new businesses. Moreover, many people interested in registering apparently believe that the initiatives will be shortlived and that those who opt for legalized activities will suffer the consequences later. Although the senior leadership appears to be strengthening its commitment to the program, it will have to build the credibility of the new measures among local authorities and the public to make progress in implementation.

II. INTRODUCTION

The state sector of the Soviet economy has long been notorious for its inadequacy in satisfying the demands of Soviet consumers. This inadequacy creates large and potentially lucrative opportunities for private businessmen³ willing to provide quality and convenience Soviet consumers cannot get from the state sector. Although the Soviet constitution of 1977 theoretically guarantees the right of citizens to engage in self-employment for private gain (except for a specific list of proscribed activities), in practice authorities have usually taken a hostile attitude toward these activities and the constitution has provided private entrepreneurs scant protection against official harassment. Moreover, until now there have been virtually no legal sources of supply from which private businessmen can obtain materials and equipment and any earnings derived from legal private activities have been subject to a steeply progressive income tax. Consequently, rather than attempt to cope with the obstacles to operating legally, most individuals responding to the lure of opportunities in the consumer sector choose to operate underground. Together these individuals constitute a large, unregulated "second economy".⁴

III. CONTROVERSIAL PROPOSALS

Reform-minded Soviet economists have long proposed taking steps to facilitate the expansion of private business by affirming the legality of self-employment and creating new opportunities for groups of individuals to form profit-sharing cooperatives. They point out that such arrangements have been adopted in Hungary

² *Pravda*, 28 May 1986.

³ The term "private business" is used in this article to denote economic operations organized and managed outside the traditional state sector of the Soviet economy (although subject to state regulation), including individual and family-run operations as well as the new type of cooperatives called for in recent Soviet legislation. The new cooperatives are partnerships organized by groups of at least 3 individuals who run the operation collectively and share the profits.

⁴ See Gregory Grossman, "Notes on the illegal Private Economy and Corruption," in *Soviet Economy in a Time of Change*, JEC, 10 October 1979, pp. 834-55.

and East Germany and make a significant contribution to the consumer sector in those countries.⁵

Reform economists argue that private business could better mobilize labor not employed by the state such as homemakers, students, and pensioners, and expand the supply of goods and services available to the population. They also argue that the private sector could respond more rapidly and flexibly to consumers' demands for goods and services of higher quality and greater variety than the state sector now provides. Some have argued that the beneficial effects of expanding the private sector would spill over into the state sector: Competition from private business would end the monopoly situation that allows state enterprises to dictate the range, quality, and cost of services available to Soviet consumers and force the state to do a better job of satisfying demand. (Competition from the private sector, however, would not force an improvement in the performance of state enterprises in the absence of effective penalties for poor performance.)

Some Soviet officials also observe that taking steps to encourage private businessmen to operate legally would enable the regime better to regulate the private sector. Proponents of this argument point out that a burgeoning "second" economy already exists, but since it operates underground, the regime is unable to control it through taxation of incomes, controls on prices, and restrictions on time spent working in jobs outside the state sector. As a consequence, these officials believe that the illegal private sector in many cases hurts the consumer rather than benefits him; large-scale theft and diversion of resources from state stores and enterprises lines the pockets of underground entrepreneurs and the corrupt officials who assist them.

Proposals to affirm the legality of private activity and expand its role have evoked strong opposition from officials and segments of the public concerned that undesirable consequences will accompany any such moves. Many party traditionalists, who believe in the Marxist principle that the party's monopoly of political power is based on monopoly of economic power, fear that expansion of the private sector could ultimately undermine political control. Those traditionalists fear that an expansion of legal private activity would make it more difficult to regulate the private sector (rather than less difficult as many reformers probably believe). As good socialists, party traditionalists believe that state ownership represents a higher plane of economic organization, therefore any expansion of the private sector is inherently regressive.

Thus, conservative officials publicly argue that expansion of the legal private sector will create additional opportunities for individual enrichment that are incompatible with egalitarian socialist principles. Many officials voice concern that theft of raw materials and spare parts from state enterprises will increase because private businessmen have few other sources of supply for those items. Managers of farms and factories fear that the creation of potentially lucrative opportunities in the private sector will lure away their

⁵ See, for example, A. Levikov "Novyy Mir," no. 4, April 1986, pp. 180-198; G. Shmelev, "Sotsialisticheskaya industriya," 24 August 1986; A. Aganbegyan, "Volkstimm," 11 March 1986; and O. Latsis, "Kommunist," no. 1, January 1987, pp. 74-82.

workers. Ordinary citizens, in letters to the media and remarks made directly to Gorbachev during his public walkabouts, have complained bitterly about high prices charged by private repairmen and vendors.

IV. THE REGIME'S RESPONSE

Taken together, four policy initiatives since the party congress in March 1986 reveal the outlines of the regime's complex response to the debate over the role of private business in the Soviet economy. The initiatives contain a mixture of liberalization and regulation that attempts a difficult balancing act—providing the benefits proponents claim while avoiding the negative consequences opponents fear:

A. THE LAW ON SELF-EMPLOYMENT

The new law, approved by the Supreme Soviet in mid-November 1986 and in effect since 1 May, affirms the legality of self-employment ("individual labor activity" in Soviet parlance) in a range of activities from handicrafts to medical service.⁶ Some features of the law—the encouragement of contractual relationships with enterprises, measures to facilitate access to raw materials and tools—suggest an effort to give private businessmen the wherewithal to operate. But authorities acknowledge that other provisions of the law were designed to prevent diversion of labor from the state sector. Participation is limited to housewives, students, pensioners, and state employees working during their free time. Members of the immediate family may participate, but hiring of outside labor is strictly forbidden.

The law contains other disincentives to full-time self-employment:

- The new law makes no provisions for private pension plans or social insurance coverage for the self-employed.
- Workers contemplating abandonment of the state sector in favor of self-employment would lose sick leave, vacation, and disability benefits.
- Persons other than pensioners, students, and housewives who chose to earn their living from full-time self-employment rather than work in the state sector would potentially risk prosecution under the state's "anti-parasite" laws, which remain in effect.

The self-employment law also requires that individuals register with the state before setting up shop and calls for a "progressive" tax on individuals' net income to prevent "excessively high" incomes. Income above 3,000 rubles per year from handicrafts and everyday services and above 300 rubles per year from medical, dental, teaching and other professional and teaching services is taxed at marginal rates lower than those in effect until now. For certain activities—such as taxi driving—individuals are required to pay annual license fees in lieu of income tax.

⁶ Most of this activity—with the major exception of private taxis—has long been legal. See the USSR Council of Ministers Resolution of 3 May 1976 in *Resheniya Partii i Pravitel'stva no Khozyaystvennim Voprosam* (1975–1977), pp. 304–307 or *Argumenty i Fakti*, no. 3 January 1984.

B. REGULATIONS ON FORMING COOPERATIVES

Decrees approved by the USSR Council of Ministers in February create new opportunities for groups of not less than three persons to form profit-sharing cooperatives to engage in three types of business—consumer services, food service, or production of consumer goods. Cooperatives may contract with state enterprises for transportation, use of facilities, and repair services. Cooperatives have the right to plan production, set prices, and determine members' wages and work rules independently, according to the decrees. Participation in the cooperatives is subject to the same limitations applied to self-employment. Each cooperative pays an income tax to the local government and retains the remaining profits for production development, social insurance funds, and wages. The tax rate is two to three percent of net income earned during the cooperative's first year, three to five percent of net income during its second year, and 10 percent thereafter.

The February decrees represent a step forward from regulations issued in October that permitted the formation of cooperatives to recycle raw materials or produce consumer goods from scrap.⁷ Those regulations were issued on an "experimental" basis and their application extended only to limited areas of the USSR. The regulations specify tax rates that would be phased in gradually, peaking after three years at 35 percent of the cooperative's net income.

C. THE CRACKDOWN ON "UNEARNED INCOME"

The measures implemented July 1, 1986, were aimed at corruption by officials and ordinary citizens and at theft and tax evasion frequently associated with underground private businesses. They set stiff penalties for failure to register businesses and pay taxes. New inventory control procedures were also introduced at state enterprises to curtail theft of materials and tools by workers moonlighting in the private sector. The measures provoked much debate about what should or should not be considered "unearned" income. In some regions, party and law enforcement authorities interpreted the decrees as a mandate for an across-the-board crackdown on private activity, driving such activity further underground and reducing the availability of goods and services produced privately.⁸

D. REGULATIONS ON "SHABASHNIKI"

These regulations issued on 15 May 1986 gave explicit legal sanction to itinerant brigades of workers, mainly in rural areas, who hire themselves out to farms to perform construction or field work. While the regulations end the ambiguous legal status of the brigades, they may also make the work significantly less attractive by putting strict controls on operations and limiting payment to rates paid for comparable work in the state sector.⁹

⁷ *Ekonomicheskaya gazeta*, no. 43, October 1986, p. 16.

⁸ *Ekonomicheskiiye nauki*, no. 11, 1986, pp. 63-70; *Izvestiya*, 28 September 1986; *Pravda*, 14 July, 1986 *Pravda*, 15 July, 1986; *Literaturnaya gazeta*, 1 October 1986, p. 13.

⁹ For a discussion of the leadership's ambivalent attitude toward shabashniki see Patrick Murphy, "Soviet Shabashniki: Material Incentives at Work," *Problems of Communism*, November-December 1985, pp. 48-57.

V. THE DIFFICULTY OF BALANCING OBJECTIVES

In trying to encourage initiative but wrapping it in red tape, in offering the promise of new opportunities for private business but also raising the specter of prosecution for receiving "unearned" income, the Gorbachev regime appears to be pursuing a precarious balancing act.

- Traditionalists, wary of any steps that might challenge communist principles and undercut party control of the economy, have almost certainly sought to prevent any significant expansion of private business. At the same time, they probably welcomed an opportunity to invigorate efforts to combat unearned income and may have viewed the decrees as a license to crack down on all forms of private entrepreneurship.
- Proponents of the new legislation on self-employment and co-operatives probably viewed the unearned income decrees as an essential complement to those laws. By increasing penalties on underground private business activity, the "unearned income" decrees may provide an inducement for underground entrepreneurs to begin to operate in compliance with the law. By thus combining the carrot and the stick, proponents would argue, the regime will gain control of a potentially lucrative source of revenue through the income tax on private business, increase its ability to satisfy consumer demand without major adjustments in resource allocation policy, and simultaneously crack down on the growth of the "second" economy outside the regime's ability to tax or otherwise control. This linkage was acknowledged by Leonid Abalkin, director of the USSR Academy of Sciences Economics Institute, who told Western journalists in November 1986 that the "unearned" income decrees and the self-employment law were originally slated to be introduced in tandem, but that the former was released first because officials found it easier to agree on what to forbid than on what to allow.¹⁰

Within the leadership, Gorbachev has taken the lead in promoting self-employment and cooperative activity. For example, when asked in Latvia in February, whether the USSR was not getting "too carried away by the private sector," Gorbachev responded that "it only seems a private sector at first sight" and went on to defend vigorously the expansion of cooperatives and the legalization of self-employment opportunities, arguing that the "foundations" of the socialized economy will remain intact, even if five to seven percent is "broken off" by self-employment.¹¹ At the Central Committee plenum in June, Gorbachev argued that although "some people see cooperatives and individual labor activity as virtually the restoration of private economic practice . . . our experience and that of other socialist countries attest to the usefulness of and need for skillful use of these economic forms within the socialist framework."¹²

¹⁰ *Washington Post*, 28 November 1986.

¹¹ Moscow Television Service, 18 February 1987.

¹² *Pravda*, 26 June 1987.

Since the self-employment law went into effect, several other Politburo members, including Premier Nikolay Ryzhkov, have joined Gorbachev in promoting the new measures. At the Supreme Soviet session following the plenum, Ryzhkov called on local authorities to make fuller use of cooperatives and self-employment and said "there must be tens and hundreds of times more cooperatives, and their contribution must be made more tangible."¹³

By contrast, certain other Politburo members may be skeptical of—if not directly opposed to—the self-employment and cooperative legislation. While Yegor Ligachev, Gorbachev's second-in-command within the party, has been generally supportive of Gorbachev's economic reforms, he may share some of the conservatives' concerns about the private sector. In a June 1985 speech to the Central Committee Academy of Social Science, he warned that there would be no "divergence toward private enterprise." In a speech to party officials in the Georgian Republic in June 1987—a month after the law on self-employment had gone into effect—Ligachev cautioned that the party's encouragement of self-employment "has nothing to do with unbridled privately owned enterprise" and emphasized that party and state organs "must keep a firm grip on the levers of economic management. It is easier to lose that grip than to regain it later."¹⁴

VI. CONFLICTING INTERPRETATIONS

This complex balancing of goals in the various laws regulating private business is likely to perpetuate controversy and confusion. Commentary on the law on self-employment reveals that officials and the public have differing—and sometimes conflicting—interpretations about what the self-employment law does and does not intend:

- A Soviet press correspondent reported that both officials and individual workers see the provisions for regulating income as a key element of the legislation. Workers told her that those provisions are too strict, while officials responsible for financial control complained that they are too lenient.¹⁵
- Articles in the Soviet press indicate that the new law is creating a stir among the Soviet citizens, but for widely different reasons. Some have reacted enthusiastically, thinking that the new law will enable them to set up their own businesses. Others, however, have cynically dismissed the law as simply an effort to tax private activity already going on underground.
- Differing perceptions of the law's main goals are also evident at the official level. Commenting on the law, some officials stress that it is intended first of all to provide the public with more goods and services and accommodate consumers' desires for quality and varied assortment. Others see the law's foremost function as giving the state the ability to control and tax existing, underground activity.¹⁶

¹³ *Pravda*, 30 June 1987.

¹⁴ *Zarya Vostoka*, 4 June 1987.

¹⁵ *Sotsialisticheskaya Industriya*, 24 August 1986.

¹⁶ *Sotsialisticheskaya Industriya*, 23 November 1986.

The restrictive spirit of the unearned income decrees also has contributed to confusion over the limits of private business. Some over-zealous local officials interpreted the decrees as a mandate to harass vendors at collective farm markets and other private businessmen. In an effort to counteract this interpretation of the decrees, top legal officials appeared repeatedly in the media to warn that the decrees should not be applied to citizens engaged in legal private business. At the same time, a debate broke out in the press among officials and economists over the proper definition of the concept "unearned income." Some argued that it should apply only to money derived from genuine illegalities such as theft and bribe-taking. Others put forth a broad definition that included gains from doing things the capitalist world would consider common business practice, raising prices when demand exceeds supply, for example.

VII. A KEY ROLE FOR LOCAL AUTHORITIES

As in the past, the new law on self-employment gives local authorities broad prerogative to expand the law's provisions and accords them a key role in providing material support for private business. This is consistent with Gorbachev's efforts to decentralize economic decision-making, but the broad delegation of power to local officials makes it likely that the law will be implemented with wide regional disparities. Prerogatives and responsibilities given to local authorities by the new measures include:

- Responsibility for assisting individual and cooperative businesses in finding sources of supply, tools, and transportation and in selling their products.
- Authority to permit individuals and cooperatives to engage in additional types of business beyond those specified in the self-employment law.
- Authority to add to the list of illegal types of business beyond those specified in the new law if it is deemed that their exercise "contradicts society's interest."
- Power to cut red tape to facilitate the formation of new private businesses. Local officials may waive registration requirements for types of activities they designate.

Supporters of an expanded private sector hope that the self-employment law will put an end to the excesses inspired by the "unearned" income decrees. Soviet press commentary indicates, however, that the predominant approach by local authorities is to prohibit rather than encourage private business, particularly in the Russian Republic. Indeed, economist Abalkin told journalists that he thought that individually-run business would not make much headway in the Russian Republic, where there is no strong tradition of such activity and public opinion is predominantly hostile to it. Abalkin went on to say that individually-run businesses will find a more hospitable climate in other areas such as the Baltic Region and the Georgian Republic.¹⁷

¹⁷ Washington Post, 28 November 1986.

VIII. A POOR BEGINNING

Despite official encouragement from Moscow, the development of legalized private businesses is off to a slow start. At the plenum in June Gorbachev claimed that many people are eager to join cooperatives or engage in self-employment, but admitted that the process of expanding private economic activity "is proceeding with very great difficulty and very slowly."¹⁸ A Moscow city official in June said that he had expected 30,000 to 40,000 applicants for self-employment during the first month after the law became effective, but only about 10,000 people had applied.¹⁹ An official of the Russian Republic—containing more than half of the country's working population—said he expects that by the end of the year there will only be about 3,000 cooperatives employing roughly 20,000 people in the republic.²⁰

Official skepticism and bureaucratic lethargy at the local level account for much of the slow start. Local authorities have often used their powers to frustrate the efforts of those who wish to start new businesses. Many applicants are forced to go beyond legal requirements in providing information for permits. Often they have to provide evidence of where they intend to acquire raw materials and convince authorities that they will not shirk their state sector jobs. Cooperatives and the self-employed sometimes must wait months until the authorities find them office space that may then require expensive repairs for which the businesses cannot obtain credit.

The reluctance of eligible citizens to take advantage of the new initiatives has also been a factor. People interested in registering apparently harbor fears that the initiatives will be shortlived and that those who opt for legal activity now will suffer the consequences later. Many people still shy away from private economic activity because they believe the stereotypes that for those with higher education, work outside the public sector is shameful. Moreover, years of marxist indoctrination have left a residue of popular antagonism toward inequality of income. In an article in the journal *Novyy Mir*, Nikolay Shmelev, of the Institute of the U.S.A. and Canada, claimed that there are those who would rather "advocate equality for everyone in poverty" than increase the availability of consumer goods through private economic activity.²¹

Arrangements for providing facilities, supplies, transportation, and equipment to individual and cooperative businesses have been another obstacle in implementing the new legislation. The Soviet economy has long been plagued by chronic and notorious shortages of these items. The new legislation encourages individuals and cooperatives to sign contracts with state enterprises for supplies. The state enterprise appears to have little incentive to provide supplies to them on contract, however, given the primacy of meeting state plans for production and sales to other state enterprises, especially if supplying individuals or cooperatives would jeopardize its own ability to meet plans and earn bonuses. Most of the burden of out-

¹⁸ *Pravda*, 26 June 1987.

¹⁹ *Izvestiya*, 6 June 1987.

²⁰ *Sovetskaya Rossiya*, 6 May 1987.

²¹ "Novyy Mir," no. 6, June 1987, p. 147.

fitting private business is placed on local government and supply agencies, who appear to have neither the will nor the means to meet those needs. As a result, many businessmen have had trouble finding reliable sources of such items. One cooperative chairman complained that regional supply organs view the relatively small orders from cooperatives as a nuisance.²² Others have indicated that private businesses often secure their supplies only after persuading enterprises to break rules prohibiting the sale of unneeded supplies.²³

The regime is making an effort to address the supply problem. The new cooperatives set up to recycle waste and produce consumer goods from scrap, could provide a creative solution to the supply problem, and an effective one given the extraordinary waste of materials in the state economy. In addition, party and government decrees published on 15 December establish penalties for enterprises holding above norm stocks and authorize them to sell any surplus items to other enterprises, cooperatives, or individuals. The decree instructs supply agencies to set up brokerage services to facilitate the sale of surplus materials and equipment.²⁴

IX. OUTLOOK

Continuing poor performance by the state sector in producing consumer goods and providing services would probably give the regime additional incentive to increase its commitment to private economic activity as a way to improve consumer welfare without requiring a diversion of investment resources and enhance prospects for meeting its commitments to the consumer. The Consumer Goods and Services Program announced in late 1985 sets ambitious targets for increased output of goods and services by the state sector.²⁵ It is doubtful, however, that the investment resources needed to meet the program's goals will be made available given the regime's commitments to defense and the demands of the modernization program in heavy industry.

If the Soviet "private sector" is to grow significantly, the expansion is most likely to come primarily in the form of cooperatives. Economist Abalkin told journalists in 1986 that while, in his view, individually-run businesses might account for only about 4 percent of national income in ten years, cooperatives could account for as much as 10 to 12 percent.²⁶

Cooperatives are seen as ideologically superior to individually-run businesses and more in harmony with Russian traditions. Gorbachev may put increasing emphasis on cooperatives to minimize ideological resistance to an expanded private sector. Legislation already passed gives cooperatives priority over individual and family business in allocation of facilities and supplies.

Before Gorbachev can hope to reap the kind of gains that he appears to expect from cooperatives and self-employment, he will eventually have to provide people with additional incentives to

²² *Sovetskaya Rossiya*, 9 June 1987.

²³ *Izvestiya*, 18 May 1987; *Sovetskaya Rossiya*, 6 May 1987.

²⁴ *Izvestiya*, 15 December 1986.

²⁵ *Pravda*, 9 October 1985.

²⁶ *Washington Post*, 28 November 1986.

become involved in such activities. Some economists and officials clearly wanted the leadership to go farther to encourage legal private business now. Geliy Shmelev, section chief at the Economics of the World Socialist System Institute, called for granting paid vacation, sick leave, pensions, and other benefits to private workers. During the Supreme Soviet debate on the self-employment law, a regional party leader argued that more should be done to give private sector workers the same status and prestige as state workers.²⁷

Along with improving incentives, the regime will ultimately have to follow through with ambitious plans outlined at the Central Committee plenum in June for introducing a comprehensive economic reform by the beginning of the 13th Five Year Plan in 1991. If the formidable obstacles to implementation are overcome, detailed central control over economic activity would be reduced and state enterprises would be transformed into profit-seekers that compete for customers. Only if the state is no longer making claims on much of their output will enterprises stop hoarding supplies and be more willing to meet the needs of cooperatives and individually-run businesses.

In the meantime, Gorbachev and other leaders will want to continue vocally to support the new measures and try to mute dissenting views. They will probably try to use the plenum's endorsement of cooperatives and self-employment to hold regional officials accountable for implementation. They will also want to use the media to play up successful private business ventures and expose obstacles hindering the expansion of the program. While these tactics fall short of the kinds of changes needed to make private economic activity flourish, they would help build the credibility of the new measures among local authorities and the public and effect some progress in implementation.

²⁷ *Izvestiya*, 22 November 1986.

THE BRIGADE SYSTEM OF LABOR ORGANIZATION AND INCENTIVES IN SOVIET INDUSTRY AND CONSTRUCTION

By Meredith M. Heinemeier*

CONTENTS

	Page
I. Summary.....	272
II. Introduction.....	273
III. Description.....	273
Types of Brigades.....	274
Aggregate	274
Khozraschet	274
Khozraschet using contract principles.....	274
Contract	274
Modern	275
Wage method.....	275
IV. Evaluation	275
Widescale establishment of brigades	275
Success indicators	276
Labor productivity	276
Wages and incentives	276
Reductions in manpower	277
Reductions in work costs	277
Other characteristics.....	277
Secondary skill acquisition.....	277
Multi-machine operation.....	277
Democratic management.....	278
Labor discipline.....	278
Future policy on brigades	278
V. Bibliography	279

I. SUMMARY

On July 12, 1979 the Central Committee of the Communist Party of the Soviet Union and the USSR Council of Ministers declared that during the upcoming Eleventh Five-Year Plan the brigade system should become the main form of labor organization and incentives in industry and construction. This goal has basically been achieved: brigades comprise the majority of the industrial workforce and nearly half of construction-installation workers. However, the most effective types of brigades (khozraschet, contract and modern) are still in the minority. It is unlikely that the brigade system had any appreciable effect on general labor productivity in industry and construction during 1981-1985, although the Soviets still see promise in it. The monetary incentives of brigades are weak and can only be strengthened by further introduction of the advanced types of brigades. On a nationwide scale, the brigade sys-

*Analyst, Soviet Branch, Center for International Research, U.S. Bureau of the Census.

tem's contributions to reducing manpower requirements and work costs, raising the shift index, lowering worktime losses, intensifying the use of machinery and improving labor discipline have all been minimal, although there are isolated success stories. So far, brigades have not been granted the power to be effectively involved in democratic management of the enterprise.

Brigades will continue to be an important element in economic planning during 1986-1990. The focus will shift away from increasing the absolute number of brigades, towards converting existing brigades to the most effective varieties. The future success of brigades relies mostly, however, on Gorbachev's willingness to loosen the centralized control of the Soviet national economy.

II. INTRODUCTION

On July 12, 1979 the Central Committee of the Communist Party of the Soviet Union and the USSR Council of Ministers declared that during the upcoming Eleventh Five-Year Plan (1981-1985) the brigade system should become the principal form of labor organization and incentives in industry and construction.¹ During the 1970's numerous brigades had experimented successfully with innovative ways to raise labor productivity and had been held up as models for other enterprises. Their methods increased output without requiring any financial investment, and thus fit handily into the nation's general effort to intensify production. With the July 1979 decree began a noisy, ill guided campaign to establish as many brigades in as many sectors as possible by 1985.

The brigade system warrants our attention for two reasons, the first being its sheer complexity. Although there is a great variety of brigades and wages methods, the Soviets have never published adequate definitions or guidelines for establishing them. Second, brigades are now firmly entrenched as the primary unit of the enterprise labor collective and are widespread in industry and construction. There is every indication that Gorbachev will continue to refine them as part of his general experiment with the labor collective during the Twelfth Five-Year Plan.

The purposes of this article are to describe and evaluate the brigade system. Chapter III presents brief explanations of the major types of brigades and the preferred wage method.² Chapter IV assesses the Soviets' achievement of the goal established in July of 1979 and the general effectiveness of brigades during the Eleventh Five-Year Plan.

III. DESCRIPTION

A brigade is simply a group of any number of workers led by one of its senior members, the brigadier. The brigadier is directly responsible to the master or other engineering-technical worker who, in most cases, does not belong to the brigade. Within the brigade there can be subdivisions called crews (*zven'ya*) supervised by crew leaders (*zven'yevyye*), who are responsible to the brigadier. The bri-

¹ TsK KPSS and Sovet Ministrov SSSR, July 1979, pp. 251, 252, 254.

² For more detailed information on all aspects of the brigade system, see Heinemeier, forthcoming.

gade members may elect a brigade council to help run the group's activities, and at enterprises with a large number of brigades, a brigadier council may be elected.³

TYPES OF BRIGADES

There are many different types of brigades, depending on their organizational features and wage methods. An ordinary brigade may be nothing more than a group of workers with a common work assignment, paid individually but with an optional collective premium. The stronger the collective aspect of wages and the more responsibility the group has, the more effective the brigade will be. Below are brief descriptions of five advanced versions of brigades.

Aggregate brigade

The aggregate (ukrupnennaya) brigade (used mainly in industry) is an oversized brigade, or an agglomeration of several small, inefficient brigades. It has a greater production capacity than an ordinary brigade, and may include engineering-technical workers. The aggregate brigade is eligible for a premium for conserving resources, producing goods worthy of the State Mark of Quality, or manufacturing new and improved consumer goods.⁴

Khozaschet brigade

The khozaschet brigade is used only in industry. (When seen in reference to construction, the term means "contract" brigade). This type of brigade works on a continuous production cycle rather than a one-time assignment, and may sign an agreement (dogovor) with enterprise management. Most important is that the khozaschet brigade is responsible for the expenditure of at least one resource and is rewarded for conserving that resource.⁵

Khozaschet brigade using contract principles

The khozaschet brigade using contract (podryadnyye) principles is a regular khozaschet brigade with slightly more responsibility and freedom of operation. Its contract is generally long-term, and its assignment is for a specific volume of work of a given quality. Because it is guaranteed its collective piece-rate if it fulfills the terms of its contract, regardless of how few workers it employs, the khozaschet brigade using contract principles has an incentive to keep membership to a minimum.⁶

Contract brigade

The contract (podryadnaya) brigade is found only in construction. It signs an agreement with the construction organization to complete a long-term assignment. The agreement not only obligates the brigade to finish its work on time according to specifications, but it forces management to provide supplies, equipment and technical assistance on schedule. The contract brigade is eligible for premi-

³ Goskomtrud and VTSPS, March 1984, pp. 6, 13.

⁴ Goskomtrud and VTSPS, January 1978, p. 3; Zheltov and Mavrina, 1980, p. 37; "Brigady," 1985, p. 19; and "Inzhener," 1985, pp. 53-54.

⁵ Goskomtrud and VTSPS, November 1983, pp. 4, 8.

⁶ Goskomtrud and VTSPS, November 1983, pp. 4, 5.

ums for delivering the construction project on or in advance of schedule, and for reducing the estimated cost of construction.⁷

Modern brigades

Modern brigades (*brigady novogo tipa*) are aggregate, complex (i.e., contain worker's of more than one profession), and multi-shift (i.e., contain crews for two or three shifts). They work on a single assignment, are paid by final results (using collective piece-rate), employ *khozraschet* principles, distribute wages using labor input coefficients and elect a brigade council.⁸

WAGE METHOD

There are many different wage methods in the 5 systems. The recommended one is to use a collective piece-rate, which is a lump sum payment for a given amount of work, plus whichever premium the brigade is eligible for. Under this arrangement, each brigade member is guaranteed his tariff wage, or the amount he would have earned working individually. All tariff wages are subtracted from the collective piece-rate, and the resulting extra earnings and the premium(s) are then distributed among brigade members using labor input coefficients (*koeffitsiyenty trudovogo uchastiya*; KTU's). KTU's are coefficients assigned by the brigadier, intended to measure each worker's devotion to his job and co-workers.

IV. EVALUATION

WIDESCALE ESTABLISHMENT OF BRIGADES

In industry, the Soviets have achieved the goal they set forth in July 1979 of making the brigade system the main form of labor organization during the Eleventh Five-Year Plan. As of 1985, 62.0 percent of industrial production workers belonged to brigades.⁹ However, the proportion of brigade members to the general workforce is much less significant than the degree to which the meaningful features of the brigade system have been applied. On this matter industry has scored rather poorly. The best type of industrial collective is the *khozraschet* brigade employing contract principles; yet these make up a scant 3.2 percent of all industrial brigades. Regular *khozraschet* brigades are the second most advanced, and their share is just 29.0 percent.¹⁰

In construction, whether the Soviets have achieved the target set in July 1979 depends upon which definition of the construction workforce is used. As of 1985, 3,114,000 people, or supposedly 80 percent of the workers in contract construction organizations, had been organized into brigades.¹¹ However, this represents just 47.4

⁷ Gosstroy et al., September 1976, pp. 74-77 and 80-82.

⁸ Goskomtrud and VTsSPS, March 1984, p. 4; Goskomtrud and VTsSPS, November 1983, p. 3; and Batalin, "Efektivnost'," 1984, p. 2.

⁹ Calculated using a mid-year average for the number of workers in brigades, and the average annual number of industrial production workers (Narkhoz 85, pp. 107-109). According to the Narkhoz, 74 percent of industrial workers were members of brigades in 1985 (Narkhoz 85, p. 108). Since we do not know how this percentage was arrived at, we will ignore it in favor of the share calculable from the number of brigade members and the number of industrial workers.

¹⁰ Figures calculated from data in "Brigadnaya," 1986, p. 55.

¹¹ "Brigadnaya," 1986, pp. 54, 55.

percent of the workers engaged in construction-installation work, and only 33.4 percent of the total number of workers in construction organizations.¹² Since there has been no legislative order to restrict the brigade system to contract organizations, it is difficult to conclude that brigades now comprise the majority of the construction labor force. Nevertheless, a respectable 48.7 percent of construction brigades are contract brigades, from which most of the benefits of group labor in construction derive.¹³

SUCCESS INDICATORS

Labor productivity

The brigade system's effect on the Soviet economy should be judged primarily by its influence on labor productivity. However, the general failure of the industrial and construction workforces to meet their targets, and the absence of any clear growth pattern make it impossible to link the steady rise in the number of brigades to an increase or decrease in labor productivity during 1981-1985.

At present, all that can be said is that the Soviets still see promise in the higher labor productivity rates of advanced types of brigades. Isolated studies have shown that industrial labor productivity is higher in brigades than among individual workers,¹⁴ and it is repeatedly claimed that labor productivity in contract construction brigades is 30 percent higher than the average for construction in general.¹⁵

Wages and incentives

The success of the brigade system's financial incentives cannot be evaluated conclusively because there are no data on average wages or premiums paid to industrial or construction brigade members. Nevertheless, we submit that the impact of monetary incentives on the general brigade population has been negligible.

The remuneration of brigades is built upon the existing wage system and therefore suffers from the same defects: a narrow grade structure and low wage rates. It is really the special collective premiums offered to *khozraschet*, aggregate and contract brigades which separate brigade wages from the general wage system. Because these advanced types of brigades have not been introduced on a wide scale, fewer than 20 percent of industrial and construction workers are even eligible for the financial incentives offered by the brigade system.¹⁶

An additional problem with wages is that the KTU often serves as a disincentive rather than an incentive to harmonious work and increased productivity.¹⁷ Because it quantifies the unquantifiable, it is completely subjective and is often the source of much controversy within the brigade.

¹² Calculated from data in Narkhoz 85, p. 377.

¹³ "Brigadnaya," 1986, pp. 55, 56.

¹⁴ See Karpukhin, 1985, p. 36 and Lobanov et al., 1981, p. 87.

¹⁵ Goskomtrud, August 1985, p. 10; Balakin, 1985, p. 10; and "Skvoznoy," 1984, p. 66.

¹⁶ Estimated for 1985 using data in "Brigadnaya," 1986, pp. 55, 56; Narkhoz 84, pp. 143, 393; and Narkhoz 85, pp. 107, 377.

¹⁷ There are numerous accounts of the jealousy engendered by KTU's. See, for instance, Gavrilenko, 1985, p. 2 and Kornev, 1981, pp. 67-69.

Reductions in manpower

Another important factor in an evaluation of the brigade system is its ability to reduce manpower requirements, since the focus of the system is the intensification of the labor force. During the Eleventh Five-Year Plan, the brigade system probably freed over 300,000 workers.¹⁸ The entire increment to the able-bodied population in 1981-1985 was only 2,459,000, and it is likely to be 3,160,000 in 1986-1990.¹⁹ Therefore, although the brigade system's impact on manpower requirements has not been great, it has been valuable.

Reductions in work costs

Evidence that brigades reduce work costs can be found only for contract brigades, most likely because no other brigades receive premiums for cost reductions, so records are not kept for them. Actual construction costs are supposedly 2.6 percent lower than planned for contract brigades, and in 1981 and 1982 combined this resulted in a savings of one billion rubles.²⁰ Since the total value of new construction in those years was 167.1 billion rubles,²¹ the contribution of contract brigades to reducing overall construction costs has not been great.

OTHER CHARACTERISTICS

Secondary skill acquisition

Members of brigades are encouraged to acquire more than one skill so that they can fill in for an absent worker or take on an additional assignment. Secondary skill acquisition (*sovmeshcheniye professii*) is often evaluated in terms of its ability to raise the shift index and lower worktime losses. There are many testimonies to the success of brigades in raising the shift index at individual plants, and it is claimed that losses are 2 to 2.5 times lower in well organized brigades than among individual workers.²² However, since only 5 percent of industrial workers practice a secondary profession,²³ the overall effect has probably been minimal.

Multi-machine operation

Brigade members are also encouraged to man more than one machine at a time, or more than the norm. So far, the application of multi-machine operation (*mnogostanochnoye obsluzhivaniye*) does not appear to be widespread. A survey of Leningrad enterprises showed that fewer than 10 percent of the workers were multi-machine operators, whereas the potential share was 20-30 percent.²⁴ It is unknown whether the wage incentive offered to such workers is not high enough. The chief obstacle seems to be the lack of clear methodical instructions for integrating multi-machine operation into an enterprise's existing production process. Enterprises wish-

¹⁸ This is a conservative estimate based on data in Osipov, 1983, p. 2 and Gorelykh and Gurar'ye, 1985, p. 103.

¹⁹ Rapawy and Kingkade, forthcoming, p. 7.

²⁰ Goskomtrud, August 1985, p. 10 and Serov, p. 59.

²¹ In constant prices, from Narkhoz 84, p. 389.

²² Prokopenko, 1984, p. 9; Mikhaylov, 1976, p. 67; and Babayev, Violentov and Sokolov, 1985, p. 14.

²³ Kostin, 1984, p. 29.

²⁴ Gorbokon', 1984, p. 30.

ing to use the feature effectively must first spend a good deal of time norming machinery operation and defining workers' responsibilities.²⁵

Democratic management

Brigades have been firmly integrated into the planning process, and the range of issues on which they may comment is rather wide. However, the actual power of the brigade is limited to electing a brigade council; distributing wages among its members (and even in this case, the brigadier assigns KTU's); and demanding the removal of an unsatisfactory brigadier. On all other issues—such as the formation of the brigade itself, the choice of brigadier, the work assignment, the punishment of violators, etc.—the brigade merely plays an advisory role, while the decision-making power rests with the enterprise director.²⁶

Labor discipline

The general nationwide campaign for labor discipline of the early 1980's is now acknowledged as a failure, except for a brief period of improvement in 1983,²⁷ which was probably a reaction to Andropov's strict attitude. Therefore, brigades have not had a significant effect on workers' attitudes. Nevertheless, it is still claimed that the brigade system strengthens discipline, and that in well organized brigades there are 1.5–2 times fewer violations of labor discipline and social order than average.²⁸

FUTURE POLICY ON BRIGADES

During the next five years, production brigades will continue to be an important element of planning for Soviet industry and construction. The campaign-like promotion of the brigade system of labor organization and incentives will gradually subside as attention is concentrated on converting to the most effective types of brigades (*khozraschet*, contract and modern). There will be increased emphasis on enlarging brigades to the shop or section level, and on including engineering-technical personnel in the brigade.

Because the concept of the enterprise labor collective has become firmly accepted (although the functions and rights of the collective may be modified), the brigade, as the primary component of the labor collective, now has a permanent niche in the organizational structure of production. In addition, the new Party program emphasizes the importance of developing communist social self-management (a feature of the brigade system) as a step on the road to full communism.²⁹ For these reasons, even though there will be pressure to modernize, existing brigades are unlikely to be disbanded for the sole reason of inefficiency, and the proportion of brigade members to the industrial and construction workforces is likely to at least remain stable.

²⁵ Yeremenko and Antsiforov, 1984, pp. 22–23.

²⁶ Goskomtrud and VTsSPS, March 1984, pp. 5–8.

²⁷ Antosenkov, 1985, p. S1.

²⁸ Gromov, Zhukov and Zavarina, 1984, p. 17 and Goskomtrud, August 1985, p. 10.

²⁹ Dyker, 1985, p. 3.

The policy of focusing on the most successful types of brigades is already evident in Gorbachev's speeches and new legislation on brigades.³⁰ It is also the most logical approach, given that the brigade system has been implemented on a massive scale, and its strengths and weaknesses are now well known. In addition, this policy is consonant with the Twelfth Five-Year Plan's paramount goal of raising labor productivity, and with the related goals of tying wage hikes to productivity increases; conserving material and energy resources; and improving the psychological climate in work collectives.³¹

However, the chief constraint on the effectiveness of brigades is the central control of the USSR's economy. The individual brigades which succeeded during the 1970's did so because of their experimental nature; they were given extraordinary support from their organizations, and creativity within the brigades was allowed to flourish. This is not yet possible on a grand scale. To illustrate, a few contract construction brigades may have the clout needed to receive equipment and supplies on time, but the majority of brigades in an organization simply could not demand the same treatment unless the entire centrally-controlled supply system were to change. The degree to which Gorbachev effects systemic economic reform will determine the success of the brigade system of labor organization and incentives.

V. BIBLIOGRAPHY

- Antosenkov, 1985: Ye. Antosenkov. "Why Does Wage Leveling Persist?" *Izvestiya*. April 26, 1985, p. 2. Translated in FBIS. *Daily Report. Soviet Union*. May 6, 1985, pp. S1-S5.
- Babayev, Violentov and Sokolov, 1985: B. D. Babayev, Ye. N. Violentov and Yu. A. Sokolov. *Brigady novogo tipa. Sozdaniye, razvitiye, effect*. Moscow: Sovetskaya Rossiya, 1985.
- Balakin, 1985: V. Balakin. "Upravleniye stroitel'stvom." *Ekonomicheskaya gazeta*. No. 4. January, 1985, p. 10.
- Batalin, 1984: Yu. P. Batalin. "Effektivnost' kollektivnogo truda." *Ekonomicheskaya gazeta*. No. 32. August 1984, p. 2.
- Bogolyubov et al. (Eds.), 1980: K.M. Bogolyubov et al. (Eds.). *Spravochnik partiynogo rabotnika. Vypusk dvadtsatyy. 1980*. Moscow: Politizdat, 1980.
- "Brigadnaya," 1986: "Brigadnaya forma organizatsii i stimulirovaniya truda v otraslyakh narodnogo khozyaystva." *Vestnik statistiki*. No. 7. July 1986, pp. 54-57.
- "Brigady," 1985: "Brigady: terminy i opredeleniya." *Ekonomicheskaya gazeta*. No. 42. October 1985, p. 19.
- Dyker, 1985: David Dyker. "The New Party Program and the Future of the Soviet Economy." *Radio Free Europe/Radio Liberty. Radio Liberty Research*, 363/85. November 4, 1985.
- Gavrilenko, 1985: Ye. Gavrilenko. "Kak izmerit' lichnyy vklad." *Sotsialisticheskaya industriya*. May 12, 1985, p. 2.
- Gorbachev, 1985a: M.S. Gorbachev. *Izbrannyye rechi i stat'i*. Moscow: Politizdat, 1985.
- Gorbachev, 1985b: M. S. Gorbachev. "Korennoy vopros ekonomicheskoy politiki partii." June 11, 1985. In Gorbachev, 1985a, pp. 108-136.
- Gorbokon', 1984: A. Gorbokon'. "Proizvodstvennyye brigady—deystvennyy instrument povysheniya koefitsiyenta smennosti." *Sotsialisticheskii trud*. No. 7. July 1984, pp. 29-31.
- Gorelykh and Gurar'ye, 1985: A.G. Gorelykh and S.S. Gurar'ye. *Upravleniye peredovym opytom v promyshlennosti*. Kiev: Tekhnika, 1985.

³⁰ See, for example, "V Tsentral'nom," 1985, p. 3; Gorbachev, 1985b, pp. 121, 131, 132; and Goskomtrud, August 1985, pp. 10, 11.

³¹ Gromyko and Menteshashvili, 1986, and Ryzhkov, 1986.

- Goskomtrud, August 1985: Goskomtrud SSSR. "O dal'neyshem razvitii podryadnykh form organizatsii i oplaty truda v stroitel' stve." August 21, 1985. *Byulleten' Goskomtruda*. No. 2. February 1986, pp. 9-14.
- Goskomtrud and VTsSPS, January 1978: Goskomtrud SSSR and Sekretariat VTsSPS. "Ob opyte organizatsii i oplaty truda v ukрупnennoy kompleksnoy brigade (Brigadir t. Vasil'yev V.M.) Odesskogo sudoremontnogo zavoda im. 50-letiya Sovetskoy Ukrainy." January 5, 1978. *Byulleten' Goskomtruda*. No. 5. May 1978, pp. 3-7.
- Goskomtrud and VTsSPS, November 1983: Goskomtrud SSSR and Sekretariat VTsSPS. "Ob utverzhdenii rekomendatsiy po vnedreniyu brigadnogo khozrascheta v promyshlennosti." November 17, 1983. *Byulleten' Goskomtruda*. No. 2. February 1984, pp. 3-10.
- Goskomtrud and VTsSPS, March 1984: Goskomtrud SSSR and Sekretariat VTsSPS. "O vnesenii dopolneniy i izmeneniy v tipovoye polozeniye o proizvodstvennoy brigade, brigadire, sovete brigady i sovete brigadirov, utverzhdennoye postanovleniyem Goskomtruda SSSR i Sekretariata VTsSPS ot 31 dekabrya 1980 g. No. 389/22-119." March 30, 1984. *Byulleten' Goskomtruda*. No. 7. July 1984, pp. 3-14.
- Gosstroy et al., September 1976: Gosstroy SSSR, Gosplan SSSR, Goskomtrud SSSR, Minfin SSSR, Stroybank SSSR, VTsSPS. "Polozeniye o novoy forme brigadnogo khozyaystvennogo rascheta v stroitel' stve—brigadnom podryade." September 10, 1976. In Sundikov et al., 1982, pp. 73-86.
- Gromov, Zhukov and Zavarina, 1984: G.A. Gromov, L.I. Zhukov, and G.V. Zavarina. *Brigady: razvitiye i effektivnost'*. Leningrad: Lenizdat, 1984.
- Gromyko and Menteshashvili, 1986: A. Gromyko and T. Menteshashvili. "Zakon Soyuz Sovetskikh Sotsialisticheskikh Respublik. O Gosudarstvennom plane ekonomicheskogo i sotsial'nogo razvitiya SSSR na 1986-1990 gody." *Ekonomicheskaya gazeta*. No. 26. June 1986, pp. 14-15.
- Heinemeier, forthcoming: Meredith M. Heinemeier. *The Brigade System of Labor Organization and Incentives in Soviet Industry and Construction*. CIR Staff Paper, Forthcoming. Bureau of the Census.
- "Inzhener," 1985: "Inzhener v brigade. Kak oplachivayetsya yego trud?" *Sotsialisticheskii trud*. No. 8. August 1985, pp. 50-55.
- Karpukhin, 1985: D. N. Karpukhin. *Kardinal' noye povysheniye proizvoditel' nosti truda—klyuchevaya zadacha ekonomiki*. *Ekonomika*, July 1985. Moscow: Znaniye, 1985.
- Kornev, 1981: A. Kornev. "Kak ya predstavlyayu sebe "ideal'nuyu" brigadu i chto meshayet yeye stanovleniyu." *Sotsialisticheskii trud*. No. 5. May 1981, pp. 66-69.
- Kostin, 1984: L.A. Kostin. "Rezervy ispol'zovaniya trudovykh resursov." *Ekonomika i organizatsiya promyshlennogo proizvodstva*. No. 1. January 1984, pp. 22-38.
- Lobanov et al., 1981: N. Lobanov, V. Marchenkov, and L. Kalinovskiy. "Effektivnost' brigadnykh form organizatsii truda." *Planovoye khozyaystvo*. No. 1. January 1981, pp. 82-87.
- Mikhaylov, 1976: G. Mikhaylov. "Brigadnyye formy organizatsii truda i ratsional'noye ispol'zovaniye tekhniki." *Sotsialisticheskii trud*. No. 9. September 1976, pp. 67-73.
- Narkhoz——: Tsentral'noye statisticheskoye upravleniye (TsSU) pri Sovete Ministrov SSSR. *Narodnoye khozyaystvo SSSR v 19—godu: statisticheskii yezhegodnik*. Moscow: Finansy i statistika. (A series of statistical yearbooks; individual volumes are cited in short form by the year and title.)
- Osipov, 1983: A. Osipov. "Optimal'nyy variant." *Trud*. December 8, 1983, p. 2.
- Prokopenko, 1984: A. S. Prokopenko. "Po konechnym rezul'tatam." *Ekonomicheskaya gazeta*. No. 11. March 1984, p. 9.
- Rapawy and Kinkade, forthcoming: S. Rapawy and W. Kingade. *Estimates and Projections of the Labor Force and Civilian Employment in the U.S.S.R.: 1950 to 2000*. CIR Staff Paper, Forthcoming. Bureau of the Census.
- Ryzhkov, 1986: N.I. Ryzhkov. "O gosudarstvennom plane ekonomicheskogo i sotsial'nogo razvitiya SSSR na 1986-1990 gody." *Trud*. June 19, 1986, p. 2.
- Serov, 1983: V. M. Serov. "Obespecheniye povsemestnogo raspostraneniya brigadnogo podryada." *Ekonomika stroitel'stva*. No. 1. January 1983, pp. 59-64.
- "Skvoznoy," 1984: "Skvoznoy potochnyy brigadnyy podryad v stroitel'stve." *Ekonomika stroitel'stva*. No. 11. November 1984, pp. 66-69.
- Sundikov et al., 1982: B.I. Sundikov, V.M. Krasovskiy and S. Yu. Vysokinskiy. *Spravochnaya knizhka brigadira stroitel'noy podryadnoy brigady*. Moscow: Stroyizdat, 1982.

- TsSK KPSS and Sovet Ministrov SSSR, July 1979: TsK KPSS and Sovet Ministrov SSSR. "Ob uluchshenii planirovaniya i usilenii vozdeystviya khozyaystvennogo mekhanizma na povysheniye effektivnosti proizvodstva i kachestva raboty." July 12, 1979. In Bogolyubov et al. (Eds.), 1980, pp. 216-257.
- "V Tsentral'nom," 1985: "V Tsentral'nom Komitete KPSS." *Ekonomicheskaya gazeta*. No. 15. April 1985, p. 3.
- Yeremenko and Antsiforov, 1984: V. Yeremenko and V. Antsiforov. "S uchetom otraslevoy spetsifiki." *Sotsialisticheskiy trud*. No. 12. December 1984, pp. 21-24.
- Zheltoy and Mavrina, 1980: Ye. Zheltov and G. Mavrina. "Ukrupnennyye kompleksnyye brigady i formy oplaty truda na lesozagotovkakh." *Sotsialisticheskiy trud*. No. 1. January 1980, pp. 37-42.

SOVIET RESIDENTIAL HOUSING: WILL THE "ACUTE PROBLEM" BE SOLVED?

By Michael V. Alexeev* †

CONTENTS

	Page
I. Introduction.....	282
II. Facets of the Problem.....	283
A. Quantity of Residential Housing.....	283
B. Quality of Existing Housing.....	285
C. Quality of Newly Built Housing.....	286
D. Housing Construction Costs, Rents, and Subsidies.....	287
E. The System of Housing Allocation.....	290
III. The Proposed Solutions.....	292
A. Investments: Current Trends and Plans for the Future.....	292
B. Investments in Private and Cooperative Housing.....	293
C. Youth Residential Complexes.....	294
D. Changes in the System of Housing Rents.....	294
IV. Concluding Remarks.....	295
V. Appendix. Types of Residential Housing in the USSR.....	295

SUMMARY

This paper describes the current status of what Gorbachev has referred to as an "acute housing problem" in the USSR. The discussion covers the quantity and quality of existing and newly built housing, trends in construction costs, and the system of housing allocation. Solutions to the housing problem proposed by Soviet leaders are evaluated in the second part of the paper. These solutions call for increased housing investments, improvement in the construction industry performance, the differentiation of rents in state-owned apartments based on their size and quality, and an increased reliance on cooperative and private construction. Accordingly, the paper contains a discussion of Soviet approaches to these issues and the prospects of solving the housing problem before the year 2000.

The state of the workers' houses gives one a yardstick by which to measure the general standard of living of the workers. (F. Engels, "The Condition of the Working Class in England," Stanford University Press, 1958, p. 78.)

I. INTRODUCTION

Housing is one of the oldest and most persistent calamities in the geographical area included in the USSR. The history of this prob-

*Assistant Professor, Department of Economics, George Mason University.

†I am grateful to David Knuti for many valuable comments and help with locating some of the primary sources for this research. Naturally, any remaining errors are my own.

lem dates back to at least the beginning of the industrial revolution in Russia in the 1860's.¹ After being virtually ignored by Stalin the housing problem has been openly recognized by Soviet leaders since the mid-1950's. Khrushchev was the first to attempt solving it through the massive investment of state funds into new housing construction. However, 30 years and almost 400 billion rubles later Gorbachev is still referring to the "acute housing problem," the solution to which represents "an enormous task." According to the current Soviet leader the manifestations of this problem include the inadequate quantity and quality of residential housing, serious shortcomings in housing allocation, and an inefficient system of housing rents.² Gorbachev reaffirmed a major goal of the Soviet housing problem—to provide every household with a separate apartment or a house by the year 2000. In order to reach this goal and solve the housing problem in general he proposed increasing residential construction and renovation, providing all possible incentives for construction of cooperative and individual dwellings, promoting building youth housing complexes, enacting changes in the system of rents, and working out incentives for improvement in construction quality as well as in the planning and design of cities and villages. In this paper facets of the housing problem will be described in greater detail and the proposed solutions will be evaluated.

II. FACETS OF THE PROBLEM

A. QUANTITY OF RESIDENTIAL HOUSING

Despite extensive efforts and large investments, housing in the Soviet Union remains considerably more scarce than in virtually all other industrialized countries. In particular, the ratio of households to the number of dwellings in the USSR remains relatively high. Moreover, estimates based on the 1979 census and other official Soviet data suggest that this ratio has increased during the 1970-1979 period from 1.23 to about 1.265.³ The high households-to-dwellings ratio implies that many households are forced to reside in so-called communal apartments and dormitories of different types. According to SSSR v tsifrakh v 1986 godu (p. 219) only 85% of all urban families live in separate apartments or houses. The corresponding figure for rural areas is 97%.⁴ Therefore, the goal of matching households to dwellings does indeed represent "an enormous task."

¹ Smith, W., Housing in the Soviet Union—Big Plans, Little Action, in U.S. Congress, Soviet Economic Prospects for the Seventies, Washington, D.C., 1973, pp. 405-406.

² *Pravda*, February 26, 1986.

³ The estimate for 1970 is taken from Morton, H., "The Soviet Quest for Better Housing—An Impossible Dream?" in U.S. Congress, Soviet Economy in a Time of Change, Washington, D.C., 1979. The figure for 1979 is the author's estimate. The methodology of estimation is available from the author upon request. In virtually all other industrialized countries in the world the households-to-dwellings ratio is equal or close to one (United Nations Statistical Yearbook, New York, 1982, pp. 462-467).

⁴ Tapilina, V. S., *Izvestiia sibirskogo otdeleniia akademii nauk SSSR; Seriya ekonomiki i prikladnoi sotsiologii*, No. 1, 1984, p. 63 (quoted from Nechemias, C., Recent Changes in Soviet Rural Housing Policy, AAAASS Conference Paper, New Orleans, LA, November 1986). It is not clear, however, whether or not singles are included in these numbers since Soviet statistical data often refer to "families" as households consisting of two or more persons.

Another important objective of the Soviet leadership proclaimed as early as the 1920's is to provide everyone in the country with at least 9 sq. meters (96 sq. feet) of "living space."⁵ This goal, however, is far from attainment. The average amount of housing in the USSR at the end of 1986 was 14.8 sq. m. or 159 sq. feet of total useful space per person.⁶ This translates into about 10.2 sq. m. or 110 sq. feet of living space. Barring exceptionally uniform distribution of housing in the Soviet Union this average implies that many Soviet citizens have considerably less than 9 sq. m. of living space. In fact, in many Soviet republics even the per capita averages of living space are well below 9 sq. m. (see Table 1).

TABLE 1.—HOUSING SPACE IN SOVIET REPUBLICS, 1985

Republic	Population (1,000's people)		Aggregate (Useful) Housing Space (1,000's sq. m.)		Per Capita Useful Space (sq. m.)		Per Capita Living Space (sq. m.)	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
USSR.....	182,930	95,854	2,560.8	1,510.5	14.00	15.76	9.68	10.90
RSFSR.....	105,268	38,812	1,491.7	646.3	14.17	16.65	9.80	11.52
Ukraine.....	33,690	17,394	507.2	326.1	15.05	18.85	10.41	13.04
Belorussia.....	6,319	3,689	86.5	72.2	13.69	19.57	9.47	13.54
Uzbekistan.....	7,745	10,742	85.3	116.1	11.01	10.81	7.62	7.48
Kazakhstan.....	9,223	6,805	113.7	90.8	12.33	13.34	8.53	9.23
Georgia.....	2,833	2,401	43.8	47.0	15.46	19.58	10.69	13.54
Azerbaijan.....	3,617	3,091	42.4	26.5	11.72	8.57	8.11	5.93
Lithuania.....	2,389	1,214	36.6	26.3	15.32	21.66	10.60	14.98
Moldavia.....	1,895	2,252	23.7	44.4	12.51	19.72	8.65	13.64
Latvia.....	1,854	768	30.5	17.9	16.45	23.31	11.38	16.12
Kirgizia.....	1,607	2,444	17.8	27.7	11.08	11.33	7.66	7.84
Tadzhikistan.....	1,553	3,095	16.9	23.8	10.88	7.69	7.53	5.32
Armenia.....	2,281	1,081	29.7	15.9	13.02	14.71	9.01	10.17
Turkmenia.....	1,552	1,718	15.6	17.9	10.05	10.42	6.95	7.21
Estonia.....	1,104	438	19.4	11.6	17.57	26.48	12.15	18.32

Note: The data on population and useful housing space were obtained from *Narkhoz* 1985, pp. 8-9, 427-428. Living space was assumed to constitute 6917 share of useful space for all republics in both urban and rural areas. This share was estimated on the basis of information published in *Vestnik statistiki*, No. 11, 1985, p. 47. The estimation methodology is available from the author upon request.

Notice that residents of the Slavic and Baltic republics enjoy more living space per capita on the average than their fellow citizens in the Soviet South in both urban and rural areas. In addition, rural residents of the Northern republics have considerably more housing space per capita than their urban counterparts. In the South, city dwellers either have much more housing space than the villagers or their endowments are approximately equal.⁷ Georgia provides the only exception to this rule. This situation can be explained in part by the fact that households in the South are typi-

⁵ Soviet statistics distinguishes aggregate housing area or total useful space (*obshchaia poleznaia ploshchad'*) and living space (*zhilaia ploshchad'*) which is defined as total space minus kitchens, bathrooms, corridors, and other auxiliary areas.

⁶ *SSSR v tsifiakh v 1986 godu*, p. 218. For comparison the per capita average of occupied heated aggregate housing space in the U.S. was almost 520 sq. feet in 1982 (calculated on the basis of *Statistical Abstract of the U.S., 1986*, Table 1318, p. 735).

⁷ One has to keep in mind that comparisons of housing space disregard urban-rural differences in housing quality which indeed are great.

cally much larger than in the Northern republics of the USSR.⁸ Also, in the Southern republics the rural-to-urban migration is relatively small compared to the Slavic republics, and population growth is higher in rural areas. These factors account for the relatively disadvantageous housing conditions of rural households in Central Asia and the Transcaucasus. In fact, in rural areas of Uzbekistan, Azerbaidzhan, and Kirgizia the amount of per capita housing space has remained virtually unchanged between 1980 and 1985 while in rural Tadzhikistan it has actually declined. In the USSR as a whole, however, the per capita amount of housing space in rural areas has been growing faster than in the cities:

	1970	1980	1981	1982	1983	1984	1985	1986
Per capita amount of useful housing space (square meters):								
Urban areas	11.0	13.1	13.3	13.5	13.7	13.9	14.1	14.3
Rural areas	10.5	13.9	14.2	14.7	15.0	15.3	15.6	15.9

Besides being a result of the migration of rural residents to cities in Slavic and Baltic republics, this tendency reflects a conscious effort by the Soviet leadership to improve rural housing in these republics in order to stem migration. The analysis of current Soviet rural housing policy in the non-black-earth zone conducted by Nchemias [1986] shows that this policy has been trying to accommodate the fundamental desires of the rural population with respect to housing. Current state policy favors detached houses for one or two families on a private plot. This represents a marked departure from the policy of the 1970's which emphasized construction of apartment buildings in "villages with a future" (*perspektivnye sela*), usually far away from the residents' private plots, at the expense of housing in "futureless villages" (*neperspektivnye sela*).

B. QUALITY OF EXISTING HOUSING

Obviously, measurement of housing space alone does not tell the whole story. The value and attractiveness of a dwelling to Soviet consumers fluctuates widely depending on its quality.

The quality of residential housing depends on a variety of factors including the interior and exterior design; degree of privacy; the presence of modern amenities such as water, sewage, electricity, central heating, etc. inside a dwelling; environmental characteristics such as noise level and degree of pollution in a neighborhood; and proximity to service facilities, shopping, schools, and transportation. While it is difficult if not impossible to quantify housing quality in the absence of a free housing market, there are data on some of its determinants.

The degree of privacy, for example, can be inferred from the proportion of households residing in separate dwellings presented earlier in this paper and the number of persons per room. The avail-

⁸ Negative correlation has been found to exist between family size and a household's per capita endowment of housing (see Valentei, D.I., *Narodonaselenie: naselenie i ekonomika*, Statistika, Moscow, 1973, p. 55 and Alexeev, M., *Factors Influencing Distribution of Housing in the USSR*, *Revue D'Etudes Comparatives Est-Ouest*, forthcoming, 1988(a).

able data on modern amenities are summarized in Table 2. It must be noted that these data do not reflect the quality of the amenities, which appear to be inferior to their U.S. counterparts. Thus, a Soviet source reports in a matter-of-fact manner that in Leningrad all housing is out of hot water for two weeks every summer due to the maintenance and repairs of the plumbing systems.⁹

TABLE 2.—AVAILABILITY OF MODERN AMENITIES—PERCENTAGES

Type of amenities	U.S.S.R.		RSFSR		
	Urban State-owned and cooperative housing		Rural State-owned and cooperative housing early 1980's	Urban State-owned and cooperative housing 1980	Rural housing 1980
	1980	1986			
Running water	¹ 89.8	¹ 92.1	² 40	³ 90	⁴ 38
Sewage	87.8	90.0	32	88	22
Central heating	86.5	89.4	36	88	26
Gas	79.4	78.0	n/a	75	n/a
Hot water	57.1	71.9	n/a	60	n/a
Baths and showers	79.9	84.0	n/a	80	n/a

¹ Columns (1) and (2): SSSR v tsifrakh v 1986 godu, p. 220.

² Column (3): Orlov, V. and Bokov, A., "Planovoe khoziaistvo", No. 5, May 1985, p. 33.

³ Column (4): "Narkhoz RSFSR" 1984, p. 259.

⁴ Column (5): Kulik, G., "Problems of Economics", Vol. 25, No. 7, 1982, p. 42.

The data in Table 2 also reveal an astonishing gap between the availability of basic amenities in urban and rural areas. As column 3 indicates, even in state-owned housing running water, sewage, and central heating are available in only 30-40% of dwellings. The corresponding figures for individual rural housing are significantly lower.¹⁰ Problems related to the quality and maintenance of these amenities are probably even more severe in rural areas than in the cities.

C. QUALITY OF NEWLY BUILT HOUSING

The relatively low quality of Soviet residential housing is improving through new construction. To be sure, even newly built apartments and houses are rather primitive by Western standards but they are more comfortable and have larger kitchens and auxiliary facilities than older dwellings. The living-to-useful space ratio keeps decreasing.¹¹ The number of persons per room in newly built housing decreased from 2.2 in 1960 to 1.5 in 1980.¹² The proportion of newly built housing with modern amenities is rising as well. However, as recently as 1978 only 30% of new rural housing had modern amenities.¹³

No discussion of housing quality in the USSR would be complete without mentioning the fact that, as a rule, newly commissioned buildings built by state construction agencies exhibit extremely poor workmanship. State commissions often accept buildings before they have been completed and the new residents have to finish the work at their own expense. Defects can include missing parquet

⁹ Mushkin, A.E., *Pravo grazhdan na zhilische*, Lenizdat, Leningrad, 1982, p. 149.

¹⁰ Orlov, V. and Bokov, A., *Planovoe khoziaistvo*, No. 5, May 1985, p. 87.

¹¹ See *Vestnik statistiki*, No. 11, 1985, p. 47.

¹² Orlov and Bokov [1985], p. 85.

¹³ *Literaturnaia gazeta*, April 30, 1980, p. 10.

floors, missing plaster on walls, crooked window frames and doors, leaking pipes, etc. It has been reported that the state spends 500 million rubles a year and residents from 800 to over 1,000 rubles per apartment on repairing construction defects. Some repairs have to be made before the new residents move in, while other defects are not fixed for years.¹⁴

These quality control problems result from the incentive system in the Soviet construction industry which favors quantitative goals over qualitative improvements. Widespread storming also contributes to the poor quality of buildings commissioned in the end of a planning period. Another important factor preventing Soviet construction workers from achieving higher quality levels is the acute shortage of measuring instruments. Only 30% of the demand for them is satisfied by the state supply agency GOSSNAB. In addition, about 30% of the instruments used in the construction industry do not function adequately, yielding erroneous results.¹⁵

D. HOUSING CONSTRUCTION COSTS, RENTS, AND SUBSIDIES

The rather modest qualitative improvements in Soviet residential construction are accompanied by rapidly rising costs of output. The index of construction costs is presented in Table 3. To be sure, improvements in quality explain only part of the cost increases. A gradual increase of the share of housing built in high cost construction areas such as the Far North, Far East, Siberia, and rural regions also contributes to the growth in costs. In addition, the proliferation of the large panel construction method in these remote areas leads to significant costs increases. The continuing growth of large panels' share in the total output of construction materials suggests that construction in remote areas will become more and more expensive.¹⁶

Also, cost overruns, especially in high cost areas, constitute an important factor in the upward trend of Soviet construction costs. Incentives in the construction industry again lie at the heart of the matter. Builders' wages and bonuses depend mostly on the ruble value of the work performed. It is in their interest, therefore, to build more expensive buildings even if it means exceeding the planned costs of construction. The state organizations which pay for the buildings usually have sufficient means to pay for moderate cost overruns. The fact that costs of cooperative housing construction, where the customers are extremely reluctant to approve any additional expenditures, rarely exceed the initial plans lends support to this line of argument.¹⁷

¹⁴ *Trud*, August 6, 1983; *Stroitel'naya gazeta*, August 24, 1983; *Literaturnai: gazeta*, December 25, 1985, p. 10; *Izvestia*, June 29, 1985; *Stroitel'* No. 9, 1984, pp. 2-4.

¹⁵ *Stroitel'*, No. 12, 1984, p. 8.

¹⁶ Rutgaizer, V., Malygin, A., Ivanov, M., *Planovoe khoziaistvo*, No. 8, August 1981, pp. 63-64. Production of different types of construction materials is reported in *Narkhoz* 1985, pp. 151-153.

¹⁷ Rutgaizer et al. [1981], pp. 62-63. Presumably, the wholesale price adjustments performed in 1984 reduced the likelihood of cost overruns. However, as long as the incentive problems in the construction industry exist, one would expect these cost overruns to continue.

TABLE 3.—RESIDENTIAL HOUSING INVESTMENTS, OUTPUT, AND COSTS PER SQUARE METER—(JANUARY 1, 1984 PRICES)

Time Period	State-Owned Housing				Other Housing						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Housing Investments (min rubles)	Housing Share in All Investments	Housing Output (min sq. m.)	Costs of Housing (rubles/sq. m.)	Investments (min rubles)	Output (min sq. m.)	Costs of Housing (rubles/sq. m.)	Investments (min rubles)	Output (min sq. m.)	Costs of Housing (rubles/sq. m.)
VI FYP		45,200	0.235	474.1	95.34	33,000	222.7	148.18	12,200	251.4	48.53
1960		10,800	227	109.6	98.54	8,000	55.4	144.40	2,800	54.2	51.66
VII FYP		52,700	189	490.6	107.42	40,500	284.5	142.36	12,200	206.1	59.19
1965		11,200	174	97.6	114.75	8,400	56.2	149.47	2,800	41.4	67.63
VIII FYP		70,400	177	518.5	135.78	54,300	313.5	173.21	16,100	205.0	78.54
1970		15,800	171	106.0	149.06	12,300	67.8	181.42	3,500	38.2	91.62
IX FYP		89,100	158	544.8	163.55	70,700	368.7	191.75	18,400	176.1	104.49
1975		19,200	149	109.9	174.70	15,300	76.2	200.79	3,900	33.7	115.73
X FYP		101,900	142	527.3	193.25	81,800	380.5	214.98	20,100	146.8	136.92
1980		21,100	140	105.0	200.95	17,100	77.7	220.08	4,000	27.3	146.52
XI FYP		127,700	151	552.2	231.26	98,500	395.8	248.86	29,200	156.4	186.70
1981		22,446	144	106.4	210.96	18,100	78.2	231.46	4,346	28.2	154.11
1982		23,982	148	107.9	222.26	19,000	79.0	240.51	4,982	28.9	172.39
1983		25,872	151	112.5	229.97	19,800	80.7	245.35	6,072	31.8	190.94
1984		26,900	154	112.4	239.32	20,600	78.6	262.09	6,300	33.8	186.39
1985		28,100	157	113.0	248.67	21,000	79.3	264.82	7,100	33.7	210.68
1986 (plan)		28,000	n/a	114.0	245.61	n/a	n/a	n/a	n/a	n/a	n/a
1986 (actual)		n/a	n/a	118.2	n/a	23,000	85.3	269.64	n/a	32.9	n/a
1987 (plan)		32,000	n/a	126.2	253.57	n/a	n/a	n/a	n/a	n/a	n/a
Overall growth (percent):											
1985-1960		260.2	-30.8	103.1	252.4	262.5	143.1	183.4	253.6	-37.8	407.8
1985-1980		133.2	112.0	107.6	123.7	122.8	102.1	120.3	127.5	123.4	143.8

Average annual growth rates (percent):

1960-1985.....	3.9	-1.5	1	3.8	3.9	1.4	2.5	3.8	-1.9	5.8
1980-1985.....	5.9	2.3	1.5	4.4	4.2	.4	3.8	12.2	4.3	7.5

Column (2). The investment data in constant 1984 prices are obtained from "Narkhoz" 1985, pp. 366, 425. Investment volumes for 1981-1983 (all housing) had to be estimated from the data in 1969 prices reported in "Narkhoz" 1983 and the 1981-1984 total given in "Narkhoz" 1985.

Column (3). Ratio of Column (2) and all investments obtained from the same sources as Column (2).

Column (4). (6) / (7). "Narkhoz" 1985, pp. 420, 425.

Column (9) and (10) were obtained as the difference between the totals and the state housing data.

Column (5), (6), and (11). Ratio of the corresponding investment volumes and housing output.

Note: The planned figures for 1986 and 1987 were taken from Daily Report, Soviet Union (Economic Supplement), Foreign Broadcast Information Service, January 6, 1986, and "Pravda," November 18, 1986, respectively. The data for actual 1986 performance are from SSSR v tsifrakh v 1986 godu.

Part of the cost increase probably reflects inflation in construction materials prices which is not entirely neutralized in the Soviet calculations of investments in constant prices.

Despite the rising costs of construction and maintenance of residential housing stock, state-owned housing rents have remained essentially unchanged since 1928. These rents do not cover even the operating costs of housing and the difference keeps growing faster than the state-subsidized housing stock. This subsidy has increased from 6.9 billion rubles in 1980 to 9.3 billion rubles in 1985.¹⁸ In addition, the state housing subsidy includes all construction costs of state-owned housing.

Members of housing cooperatives do not pay rents but make payments on their mortgages. Until 1982 the government used to lend individuals up to 60% of the construction costs of their apartments at 0.5% simple interest rate for 10-20 years. In 1982 the minimum downpayment was reduced to 30%.¹⁹ The state also provides loans for the construction of individual houses but on much less favorable terms.²⁰ Therefore, the state housing subsidy to members of housing cooperatives and to individual homeowners is limited to an interest rate subsidy. This subsidy is difficult to estimate since determination of an equilibrium interest rate in the Soviet housing market is all but impossible.²¹

E. THE SYSTEM OF HOUSING ALLOCATION

Low rents combined with the relatively small stock of residential housing in the USSR lead to a high and persistent excess demand for state-owned housing. The existence of excess demand necessitates using various non-price rationing mechanisms to allocate scarce apartments among consumers. One of these mechanisms is the waiting list.

Officially the only compelling reason for a household to be placed on a waiting list for improved state-owned housing is "genuine need." Typically, a family should not be allowed to join the list unless their per capita living space is less than 5-7 square meters (these numbers vary from city to city).²² Allocation of cooperative and individual housing is not regulated as strictly as of state-owned housing but some restrictions exist there as well.

It is well known, however, that the system of housing allocation in the USSR lends itself to corruption and the preferential treatment of certain customers.²³

¹⁸ Narkhoz 1985, p. 412.

¹⁹ *Resheniia partii i pravitel'stva po khoziaistvennym voprosam*, Moscow, vol. 14, 1983, p. 543. The minimum amount of downpayment is lower for certain high priority regions in the USSR such as the Far North, Far East, and some others.

²⁰ The maximum amount of the loan is 3,000 rubles (Trehub, A., *The Outlook for Cooperative Housing*, *Radio Liberty Research Bulletin*, RL 372/85, November 9, 1985, p. 3). An average cost of a house calculated as a product of per square meter costs and average size of newly built individual houses is around 15,000 rubles. However, in rural areas kolkhozes often provide low interest loans to their members and even pay half of the construction costs *Pravda*, July 11, 1978).

²¹ At the same time it is clear that the 0.5% rate is "too low" since savings banks in the USSR pay between 2-3% interest on an individual's savings.

²² Antoshkin, P., and Osipov, D., *Kommissiia po zhilishchno-bytovoi rabote profkoma*, Moscow, 1985, p. 47. The per capita amount of housing is not the only criterion in determining genuine need but is by far the one most commonly used.

²³ See, for example, *Pravda*, June 10, 1986; *Trud*, April 29, 1986; *Sotsialisticheskaia industriia*, November 12, 1985; *Trud*, February 17, 1985 to name a few. The significance of the second econ-

Procurement of improved state-owned housing through the second economy can be accomplished in at least two ways. One can either bribe the officials responsible for allocation of housing or one can use apartment exchange, facilitating the exchange with a side-payment to the household moving to the smaller dwelling.²⁴ In the first case the bribe does not always have to be given in cash. It can involve exchange of favors instead. Also, well-off parents can buy membership in a housing cooperative for their children thus improving their own housing conditions.²⁵ This is not in itself an illegal action. However, the requirement of "genuine need for improved housing" necessary for cooperative membership eligibility often has to be bypassed with the help of bribes and connections. Even when the purchase of a cooperative apartment is legal it obviates the rules of administrative rationing of state-owned housing in the USSR.

Application of multivariate regression analysis to the data from the Berkeley-Duke survey of 1061 recent Soviet emigre households reveals that even in the case of state-owned housing the impact of per capita income from all (legal and illegal) sources is positive and highly statistically significant. This relationship was established controlling for variables representing the official status of a household in Soviet society. While positive correlation between income and housing conditions is not always caused by some illegal action on the part of a household it nonetheless suggests that administrative rationing of housing in the Soviet Union is often replaced by market forces. In one way or another higher income families end up with a greater amount of living space than lower income families. The income elasticity of state-owned housing consumption was estimated at 0.24 for former residents of the Northern republics and at 0.35 for former residents of the Southern republics.²⁶

These elasticities are within the range of income elasticity of housing demand estimates for the U.S.²⁷

Of course, not all apartments are obtained with the help of bribes and side-payments. Administrative non-price rationing obviously takes place, even in a system permeated with corruption and other second economy activities. Nonetheless, one can conclude that

omy in the residential housing area can be inferred from the importance given to it in the recent decree on the "unearned incomes." In addition to the second economy the system of privileges thoroughly described in Matthews, M., *Privilege in the Soviet Union*, Allen & Unwin, London, 1978, is responsible for a significant proportion of deviations from the "genuine need" criterion in housing allocation in the USSR.

²⁴ *Ekonomicheskaya gazeta*, No. 36, 1986, p. 18; *Prauda*, October 6, 1986; *Trud*, September 5, 1986. For a more comprehensive discussion of this phenomenon see Alexeev, M. "The Effect of Housing Allocation on Social Inequality: A Soviet Perspective," *J. Comp. Econ.*, forthcoming, 1988(b).

²⁵ In the poorer families children are often forced to live with their parents long after they have grown up and started working. It is not unusual for a married couple to continue sharing an apartment with the parents of one of the spouses.

²⁶ These estimates were obtained on the basis 598 observations for the Northern republics and 206 observations for the Southern republics. For the corresponding estimates for cooperative and private housing in the USSR and a detailed description of the survey data and estimation procedure see Alexeev [1988(a)].

²⁷ For a survey of income and price elasticity based on the U.S. data see Mayo, S.K. "Theory and Estimation in the Economics of Housing Demand," *J. Urban Econ.*, vol. 10, pp. 95-116, 1981. The corresponding estimates of income elasticity of housing demand for the U.S. vary from .08 to .44 for renters and from .21 to .61 for owners. One must keep in mind, however, that the nature of the housing market in the Soviet Union is quite different from that in the U.S.

market forces play quite an important role in the distribution of all types of residential housing in the USSR.

III. THE PROPOSED SOLUTIONS

Soviet leaders realize that solutions to the housing problem have to address all of its facets. Their approach consists of two major elements. The role of greater investments is to increase the quantity and quality of housing, while changes in the system of rental payments are supposed to improve the efficiency of housing distribution and reduce the state housing subsidy.

A. INVESTMENTS: CURRENT TRENDS AND PLANS FOR THE FUTURE

The figures in Table 3 show that despite a steady increase in the ruble value of investments in residential housing the total amount of housing space built with these investments remained fairly stable since 1970, rising slightly during 1983-85.

Virtually no increase in housing construction over the 1981-1985 level was envisaged at the preliminary planning stage for the XII Five-Year Plan (FYP). However, despite the announcement of the 565-570 million sq. m. figure at the XXVII Congress of the CPSU the final version of the XII FYP contained a much greater target of 595 million sq. m.²⁸ Moreover, even that target has been reconsidered. The most recent Soviet projection for the XII FYP states that 620-630 million sq. m. of housing will be commissioned.²⁹ This figure is consistent with the 1987 annual target of 126.2 million sq. m. at a total cost of 32 billion rubles.³⁰ These record-breaking plans testify to the strengthened commitment of the Soviet leadership to remedying the housing problem.

Given the plans for 1986 and 1987 one can project possible output volumes for 1988-1990 (in million sq. m.):

	1986	1987	1988	1989	1990	Total
Version A:	114	126.2	126.4	126.6	126.8	620
Version B:	114	126.2	127.8	130.0	132.0	630

It is interesting that the planned investment and construction figures for 1986 imply decreasing construction costs and 1987 projections imply only a slight increase in these costs compared to 1985. However, the costs of state housing construction in 1986 exceeded those for 1985 by almost 2% (see Table 3). There is no reason to expect that the costs of construction of private and cooperative housing went down either. The costs increases cannot be easily contained. New apartment designs are more expensive than the old ones. In general, the desire for improved quality in residential housing slows down quantitative advances. Most likely qualitative improvements will have to be sacrificed if the goal of providing each household with a separate dwelling is to be reached by the year 2000. The current Soviet demographic situation, with a grow-

²⁸ *Pravda* March 4, 1986; *Pravda*, June 19, 1986.

²⁹ Daily Report: Soviet Union, Foreign Broadcast Information Service, November 24, 1986, p. R5.

³⁰ *Pravda* November 18, 1986.

ing number of singles and small families creates an additional obstacle to achieving this goal.

Also, planned increases in residential construction in Siberia (especially in Tiumen' province), the Far North, and the Far East as well as a 27% planned increase in rural construction will make it extremely difficult to hold down construction costs. In addition, inflation in construction materials prices and unplanned cost overruns are likely to continue.

One way to cut costs is to reduce the number of unfinished projects and shorten the average period of construction. However, so far no Soviet administration has been able to achieve this. Current government efforts to improve the management of and "economic mechanism" within the construction industry were highlighted by the September, 1986 Decrees of the Central Committee of CPSU and the Council of Ministers.³¹ The measures suggested included reorganization of the construction industry on a regional basis; allowing construction agencies to keep 75% of the cost savings they are able to achieve; increasing incentives for speedy commissioning of projects, etc. It is doubtful, however, that these measures will significantly alter the 30 year upward trend in construction costs and the perennial problem of unfinished construction.

The residential construction goals imply a significant increase of the share of housing in total capital investments in the economy during 1986-1990. This share apparently will remain high through the end of the century in order to achieve the goal of building 2 billion sq. m. of housing during the 1986-2000 period.³² This goal implies that residential construction in each of the following two five-year plans will have to reach about 700 million sq. m.

B. INVESTMENTS IN PRIVATE AND COOPERATIVE HOUSING

In order to achieve these record high levels of construction, growing importance is assigned to private and cooperative housing investments.³³ It is hoped that the efforts and savings of individuals combined with state loans on favorable terms will facilitate rapid increases in housing construction. Changes in Soviet law enacted during the 1980's are supposed to make it easier to join housing construction cooperatives, build private houses, and obtain loans for construction. However, new construction will require the same kinds of material resources as does state-built housing. The housing cooperatives and individual builders would have to compete with investment demands by the state agencies for manpower, equipment, and construction materials.³⁴ The history of Soviet planning suggests that private demand for resources will have to yield to higher priority claimants such as heavy industry and defense.

There are other obstacles in the way of increasing cooperative and private investments. Construction agencies are often reluctant

³¹ *Pravda*, September 13, 1986.

³² This figure was reported in *Pravda*, March 9, 1986.

³³ Enterprise funds constitute another source for additional investments into residential housing. They are supposed to account for 8.2 million sq. m. of housing construction in 1987 (*Pravda*, November 18, 1986). However, enterprise funds financing can be considered as a quasi-state source of investments and is not discussed here separately.

³⁴ The demand for manpower could be somewhat relieved by requiring future residents to contribute their labor to construction of the buildings. Skilled labor and other resources, however, would have to come from the state.

to contract with cooperatives because in cooperative buildings the agency workers are not entitled to any apartments. At the same time 10% of all housing built for state and quasi-state organizations is allocated to the builders of this housing.³⁵ In addition, the cooperatives' demands for quality and financial discipline are more vocal than those of the state-financed customers. It is also possible that individual housing construction will be somewhat hampered by the 1986 law against so-called "unearned incomes" which requires citizens building a house or a dacha worth more than 20,000 rubles to disclose their source of income.³⁶ In short, facilitating individual investments in housing is a sensible policy but it does not appear that the efforts of housing cooperatives and individuals can make a big difference in solving the housing problem under the current circumstances.

C. YOUTH RESIDENTIAL COMPLEXES

One of the ways to reduce construction costs is to take into account the present demographic situation in the USSR. The increased proportion of singles, pensioners, and two-person families in the Soviet population calls for corresponding accommodations which would include smaller apartments with higher living-to-useful space ratios but would provide for a wide range of personal services and social activities in the neighborhood.

This kind of thinking seems to lie behind the phenomenon of Youth Residential Complexes (YRC). Only 69 of them existed in 1985³⁷ but their construction will presumably accelerate significantly after Gorbachev's recent endorsement. The complexes are built for the most part by the future residents—young people between the ages of eighteen and thirty—in their free time utilizing the materials provided by the enterprises where they work. It is not entirely clear who puts up the money but all that is required from the young people is time and effort. These YRC's are rather popular with the young since they provide a unique opportunity for those without the means to buy a cooperative apartment to acquire a place of their own.³⁸

However, the accommodations in the YRC's do not provide young families or singles with well-appointed separate apartments. Even in the better ones there is only one communal kitchen for every floor and no cooking facilities inside the apartments. Also, it is not clear what happens to families as they grow older and larger. There are no guarantees that they would be able to move to more suitable accommodations.³⁹

D. CHANGES IN THE SYSTEM OF HOUSING RENTS

Under the present circumstances solutions to the housing problem cannot be based solely on increasing the amount of housing stocks. It can be argued that given the existing low rents a housing

³⁵ *Sbornik postanovlenii SSSR*, No. 11, 1967, p. 69.

³⁶ *Pravda*, May 28, 1986.

³⁷ *Komsomol'skaia pravda*, December 7, 1985.

³⁸ *Izvestiia*, September 30, 1985; *Trud*, August 6, 1985; *Trud*, July 9, 1985.

³⁹ *Izvestiia*, July 9, 1985. It is not clear whether the families living in YRC's are considered by Soviet statisticians to have separate apartments or not.

shortage cannot be eliminated in principle.⁴⁰ Therefore, it is necessary to change the system of housing rents, curbing consumer demand for housing and improving utilization of the existing stock. Most of the suggestions appearing in the Soviet literature propose a substantial increase in rents on the above norm living space enjoyed by a household.⁴¹ Implementation of these proposals should probably be accompanied by the establishment of a mechanism of housing redistribution to allow families which cannot afford to pay higher rents to move into smaller dwellings.

These proposals appear sound in many respects. Their implementation would reduce corruption and other illegalities in the housing allocation process. They would lead to a sharp reduction in the state housing subsidy and greater efficiency of housing utilization. Besides, increased rents would soak off part of the 220 billion rubles in personal savings deposits and reduce the effective consumer demand for other goods. This would allow the state to redirect the resources from the production of those consumer goods to bringing the housing conditions of the poorer part of the population up to the proclaimed "sanitary norm." Therefore, higher rents could lead to an increase in the share of resources allocated to residential housing construction.

IV. CONCLUDING REMARKS

The current housing policy of the Soviet government reflects a strong commitment to solving the housing problem before the end of this century. This policy includes a sharp increase in the level of investments into residential construction; some restructuring of the construction industry; promoting individual and cooperative housing construction; and, almost surely soon to come, significant changes in the system of housing rents. However, even if this commitment is preserved the housing problem in the USSR would probably not be completely solved by the year 2000. For example, it is highly unlikely that virtually all Soviet citizens will enjoy at least 9 sq. m. of living space before the end of the century. Given the rates of population growth in Central Asia and the slim prospects of migration of the Central Asian population out of their homeland, realization of this goal would require a major commitment of construction industry resources to that region. No such commitment has been expressed to date. However, even though solving the housing problem within the next 13 years may prove to be all but impossible, a major improvement in the housing conditions of the Soviet population is probable unless other priorities force Soviet planners to sharply reduce the level of investments in residential construction.

V. APPENDIX. TYPES OF RESIDENTIAL HOUSING IN THE USSR

There are three major forms of housing ownership in the Soviet Union: state, cooperative, and private. Of all residential housing 55.9% belongs to the state. Most of

⁴⁰ Kornai, J., *Economics of Shortage*, North Holland, Amsterdam, 1981, p. 503.

⁴¹ Orlov and Bokov [1985], p. 89; Serebrennikova, T. I. and Shatalin S. S., *Izvestiia akademii nauk SSSR: seriya ekonomicheskaya*, No. 3, 1986, pp. 6-8. In 1981 44.3% of urban households and 50.3% of rural ones had "excess housing" (Sarkisian, G. S., *Narodnoe blagosostoianie v SSSR*, Ekonomika, Moscow, 1983, p. 190).

it is concentrated in urban areas where state housing accounts for 71.7% of all housing space. Its share in rural areas is only about 29%.⁴²

State-owned housing is comprised mostly of multi-story buildings and includes apartments occupied by a single family, communal apartments, and various dormitory-type accommodations. Of this housing 40% is managed by municipal authorities.⁴³ The rest of it is administered by state enterprises, trade-unions, and other public quasi-state organizations (departmental, or "vedomstvennyi" housing).⁴⁴ Municipal housing can be allocated to any citizen, whereas departmental housing is primarily for the use of employees and members of the respective enterprises and organizations.⁴⁵

Privately owned housing in the USSR consists of single family houses or parts of houses and is concentrated in rural areas where it accounts for 70.9% of all housing space, versus only 22.9% in urban areas. Ideologically, private housing represents the least acceptable form of housing ownership in the USSR. There are several legal restrictions imposed on it. For example, Soviet law prohibits building privately owned dwellings in cities with populations over 100,000.⁴⁶ Also, no family is allowed to own more than one house or part of a house suited for year-round occupancy, and with few exceptions the amount of living space in this house cannot exceed 60 sq. m.⁴⁷

Housing construction cooperatives exist almost exclusively in medium-sized and big cities and account for only 3.4% of all housing space in the USSR. A housing cooperative is a voluntary organization of citizens who wish to improve their housing conditions by building an apartment building(s) using their pooled resources and government credit. Members do not legally own their apartments but become shareholders in a cooperative, although some important rights usually associated with ownership accrue to them. An apartment is "granted" to a shareholder for permanent use and it is fairly difficult to take it away.⁴⁸ In fact, the housing cooperative appears to be a rather democratic organization—not only by Soviet standards.⁴⁹

⁴² These estimates are based on *SSSR v tsifrakh v 1985 godu*, Moscow, 1986, pp. 202-203, 209, assuming that the cooperative form of housing ownership was virtually non-existent before 1961 and that all cooperative construction took place in urban areas.

⁴³ *Izvestiia*, August 18, 1985.

⁴⁴ Technically speaking, even though housing of trade-unions etc. does not belong to the state and some authors prefer to consider it as a separate category, its legal status is almost identical to that of housing managed by state enterprises (Prokopchenko, I.P., *Zhilishchnoe i zhilishchno-stroitel'noe zakonodatel'stvo*, Stroiizdat, Moscow, 1977, p. 38).

⁴⁵ The Soviet government is trying to force the enterprises to turn their housing stock over to municipal authorities. This is not an easy task, however. For a brief discussion of this issue see Trehub, A., "Housing: More Power to the City Soviets?" *Radio Liberty Research Bulletin*, RL 387/85, November 1985.

⁴⁶ Morton [1979], p. 794.

⁴⁷ Prokopchenko [1977], p. 46.

⁴⁸ Vatman, D., Lipetsker, M., Khinchuk, V., *Kooperativy: kvartira, dacha, garazh*, Moscow, 1982, pp. 88-93.

⁴⁹ To be sure, this democracy is not absolute. An interesting literary description of an almost successful attempt to violate it is provided in Voinovich, V., *Ivan'kiada*, Ardis, Ann Arbor, 1976.

GORBACHEV'S ANTI-DRINKING CAMPAIGN: A "NOBLE EXPERIMENT" OR A COSTLY EXERCISE IN FUTILITY?

By Vladimir G. Treml*

CONTENTS

	Page
Summary	297
1. Drinking and Alcohol Abuse in the USSR in the Early 1980's.....	297
2. The Record of Anti-Drinking Policies Before Gorbachev.....	300
3. Gorbachev's Campaign.....	302
4. Results: An Interim Assessment.....	305

SUMMARY

By the early 1980s heavy drinking and alcohol abuse in the USSR reached crisis proportions. Drinking reached 16 liters of absolute alcohol per person and was significantly affecting labor productivity, mortality and other health indicators. Gorbachev's campaign introduced increased penalties for drunkenness, restrictions on sale, higher prices, and reductions in production of alcohol. In 1986 the legal consumption of alcohol was cut by a remarkably high fifty percent. Media reports a commensurate decline in adverse consequences of alcohol abuse. Increased consumption of illegal homemade alcohol, losses of state revenues, and unexpected side effects produced by the campaign suggest that its success should be viewed with caution and its long term prospects as uncertain.

1. DRINKING AND ALCOHOL ABUSE IN THE USSR IN THE EARLY 1980's¹

Gorbachev's "perestroika" or restructuring of the Soviet system is proceeding at a brisk pace. Administrative reforms have been announced, laws changes, experiments launched, and key party and state officials have been moved around or dismissed. It is too early to speculate on the progress of reforms or to rank them in terms of their impact on the system, but the all-out attack on drinking and alcohol abuse is one of the most significant of Gorbachev's programs. Discussed at a Politburo meeting in April (Pravda, April 5,

*Professor, Department of Economics, Duke University.

¹ For some of the recent studies see Keller and Efron 1974, Segal 1976, Connor 1979, and Field and Powell 1981; and best Soviet source Lisitsyn and Kopyt 1983. Part of the research for this study was done for the project on the quality of life in the USSR directed by Dr. Murray Feshbach of Georgetown University. The author is grateful to him and to Maurice Friedberg, Gregory Grossman, Aron Katsenelinboigen, and David Powell for their comments on earlier drafts. The responsibility for errors is, of course, the author's.

1985, p. 1) and announced in May of 1985, only two months after Gorbachev became the General Secretary, it was his first major innovation and clearly high on his priority list. Some two years later it can be said that the anti-drinking campaign has so far affected the lives and pocketbooks of people, the state budget and local finances, regional income distribution, and generally the life in the country to a much greater degree than his other innovations and reforms. The popularity of the new General Secretary, increases in labor productivity, in economic efficiency and, thus, the ultimate success or failure of "perestroika" depend to an important degree on the results of the anti-drinking campaign.

By any international or historical standard, the Soviet Union was by mid-1980s facing an alcohol problem of truly crisis proportions. Between 1955 and 1984, consumption of alcohol rose 2.5 times, reaching a level of more than 16 liters of absolute alcohol per year per person 15 years old and older.² Drinking and alcohol abuse by women and minors was growing particularly rapidly. But this is not the whole story, though, as per capita consumption statistics alone do not fully reflect the negative consequences of drinking. The overall magnitude of adverse health effects in a country depends not only on the total amount of alcohol consumed but on a number of other factors such as the distribution of drinkers by quantities of alcohol consumed, types of beverages used (e.g., distilled spirits, wine, or beer), and the mode of drinking. Thus countries such as France, Portugal, or Italy have recorded per capita figures as high as 18-20 liters without experiencing the adverse health effects that have been observed in the USSR. The reason is that a very high share of total alcohol in these countries is consumed in the form of wine with low alcohol content. In the USSR, on the other hand, vodka and other strong beverages account for 62-63 percent (Treml 1986, p. 12) of total alcohol consumed, which results in higher levels of violence associated with drinking, more severe accidents, more fatal alcohol poisoning, and aggravation of cardiovascular and other somatic problems. The preference of Soviet drinkers for consuming large quantities of alcohol in a short period of time and without food intake is another factor that increases the overall adverse effect on population health.

Demographers agree that heavy drinking has contributed significantly to increasing morbidity and mortality in the USSR. In the early 1980s, premature deaths directly and indirectly caused by alcohol accounted for about one-fifth of all deaths. Particularly alarming to the Soviet authorities, moreover, is the fact that these deaths were concentrated primarily among men of working ages.

² In the absence of Soviet statistics on alcohol in the past the author had made and published several series of estimates on production and consumption of alcohol (Treml 1982, 1986). Departing from the past practice the 1985 statistical handbook published several sets of data on alcohol (*Narkhoz* 1985, p. 254, 471, and 609). For three years for which both Soviet and the author's per capita data are available the difference is only 0.1 percent suggesting that the estimates are fairly accurate. Accordingly, Soviet newly available data will be used in this paper whenever possible. For years for which Soviet data are not available, the earlier author's estimates will be used. The figure of 16 liters of absolute alcohol used in the test was based on the Soviet data for 1984 and adjusted upward to reflect consumption of homemade alcohol estimated at 4.3-4.4 liters of *samogon* and 0.5 liters of of homemade wine (Treml 1986, p. A26 and A34). The author's *samogon* estimates are very rough. However, a recent Soviet article reported that *samogon* makers used up more than one million tons of sugar annually (Bazhenov 1985, p. 11), a figure which is broadly consistent with the author's estimates.

Life expectancy (at birth) of men dropped by a full five years from 67 years in 1964 to 62 by the end of the 1970s, recovering by one year to 63 in the early 1980s.³

In some categories, alcohol related mortality in the USSR is completely out of the range of world experience. The number of deaths from acute alcohol poisoning, for example, rose to a staggering 51,000 by the late 1970s. This translates into some 19.5 deaths per 100,000 of population, as compared with a rate of 0.3 for 19 countries for which data are available (Trembl 1982a, pp. 487-505).

Other statistics illustrating the extent of alcohol abuse in the country are equally alarming. In the early 1980s, drunken drivers were responsible for 13,000-14,000 vehicular traffic deaths and 60,000 serious traffic injuries, while some 800,000 drivers were arrested for driving while intoxicated. The rate of arrests per million vehicle-miles was about 10 times higher than in the U.S. In the late 1970s, some 15 million drunks were arrested and placed in sobering-up stations annually (Trembl 1985, pp. 58-59).

Heavy drinking and alcohol abuse were major contributing factors in the growth of violent and property crime, divorce, spread of venereal disease, congenital birth defects, mental illness, suicide, and other social anomalies. Drinking in the work place (common since the 1960s), reporting to work under different degrees of intoxication or with a hangover, and the growing number of workers suffering from alcoholism has adversely affected labor productivity in the country. Anecdotal evidence abounds, but unfortunately we do not have enough statistical data for a reliable analysis of the impact of alcohol in the productive sphere. In the early 1970s, two prominent Soviet statisticians reported that, according to their estimates, alcohol abuse in the country reduced labor productivity by some 10 percent (Strumilin and Sonin 1974, p. 38). In the absence of data and documentation we cannot verify or update this estimate, but if we were to accept it as correct a similar measure for the mid-1980s could easily have reached 15-17 percent.

The overall picture conceals important regional and ethnic differences. In order to simplify the situation, we can divide the Soviet population into three distinct groups. The Slavs, Russians, Ukrainians, and Belorussians, have by far the highest per capita use of absolute alcohol, and this alcohol is consumed mainly in the form of strong beverages, i.e., vodka and homemade moonshine, and fortified grape and fruit wines. Per capita consumption of state-produced beverages in the three Baltic republics is higher than among the Slavs, but their aversion to samogon makes the overall consumption lower; more beer and less strong beverages also distinguishes them from the Slavs. Moldavians, Armenians, and Georgians, that is, the populations of wine-growing republics, consume less alcohol per capita than the Slavs, with wine of lower alcohol content being the main beverage. Muslims populating

³ See Feshbach 1982, pp. 33-35, 1985, pp. 43-45, and Trembl 1986, pp. A54-62. The alarming drop in life expectancy estimated by Feshbach and others through 1984 is now confirmed as *Narkhoz* resumed after a gap of 15 years publishing life expectancy statistics (1985, p. 547). The newly released data show an increase in life expectancy of one year in the 1985-1986 period and also a drop in the crude death rate from 10.6 deaths per 100,000 in 1985 to 9.7 in 1986 (*Pravda* January 15, 1987, p. 3) attributing these changes mainly to the success in the anti-drinking campaign.

Soviet Central Asia consume on a per capita basis about 40 percent of the USSR average consumption. The differences in per capita consumption, beverage-mix, and in native traditions result in substantially different adverse health and social effects of alcohol, as can be seen from the following comparisons for the late 1970s (Zai-graev 1983, p. 96):

Republics	Number of alcoholics (per capita)	Disturbances of public order ¹ (per capita)
USSR average	100.0	100.0
RSFSR	111.6	138.2
Baltic	95.0	95.4
Central Asia	53.6	50.2
Transcaucasia	27.5	9.6

¹ Arrests and confinements in sobering-up stations)

Death and birth rates, morbidity and other health indicators show similar differences. Alcohol abuse and heavy drinking is thus essentially concentrated in Slavic republics which has important implications for the nationality policies of the Soviet state.

The financial aspects of alcohol consumption in the USSR must be mentioned here because of their implications for policy. Because of the high quantity of beverages consumed and their high prices, in the mid-1980s Soviet households spent about 15 percent of their total money income on alcoholic beverages, a very high ratio by historical or international comparison.⁴ Income from excise (turn-over) taxes and taxes on profits of the alcohol industry and foreign trade in alcoholic beverages generated between 12 and 14 percent of total state budgetary revenues, which is an unusually high share for a modern industrial state (Treml 1986, pp. A46-50).

This summary of the situation with regard to alcohol on the eve of Gorbachev's anti-drinking campaign would be incomplete without mention of the flourishing underground alcohol market created by high state prices of beverages and numerous restrictions on consumption. In the early 1980s the illegal home production of moonshine or samogon was estimated at over 2 billion liters and accounted for close to 30 percent of the total consumption of absolute alcohol. Home producers also made grape and fruit wines, beer, and a variety of bogus vodka from stolen technical alcohol. Restrictions on hours and locations of sales of alcoholic beverages in the state trade network resulted in the emergence of a large black market. Middlemen, such as taxi drivers and employees of state liquor stores, would buy vodka at state prices during legal hours and resell it at a hefty premium during off hours or in places where such sales were prohibited. A variety of other methods of cheating the customers and the state emerged (Treml 1986a).

2. THE RECORD OF ANTI-DRINKING POLICIES BEFORE GORBACHEV

A legitimate question to be asked at this point is why the Soviet authorities allowed the situation to develop in the way that it did for so long.

⁴ A roughly comparable ratio for the US was 1.8 percent.

Khrushchev was the first Soviet leader to explicitly recognize the existence of alcoholism and alcohol abuse in the country in announcing a major anti-drinking campaign in 1958 (*Spravochnik* . . . 1959, pp. 404-408). Several more campaigns of different durations and intensity were launched in later years. All campaigns had essentially the same character. They would start with condemnation of drinking, calls for temperance, and announcement of government plans to reduce production of alcoholic beverages. Their main focus would consist in raising prices of alcoholic beverages, expanding the penalties for drinking and alcohol abuse, and imposing restrictions on sales of beverages such as placing certain areas off limits for drinking or serving, or restricting the hours for the sale of alcohol.

An interesting feature of the anti-alcohol policies of the state was the low priority placed on medical aspects of the problem, i.e., treatment, post-treatment counselling, and rehabilitation of people with alcohol dependence. While there had always been excellent physicians treating alcoholics, and advanced research on alcoholism was pursued in some institutes, the public health organizations of the USSR clearly did not view alcoholism as their responsibility. This position is not surprising as it simply reflected the attitude of the central authorities. For example, in the 8,000 word declaration of policy of the 1958 anti-drinking campaign the health issues and the role of the Ministry of Health were not even mentioned among directives addressed to dozens of state organizations and agencies (*Spravochnik* . . . 1959, pp. 405-408). The 1972 anti-drinking campaign did recognize the need of medical intervention but in superficial terms. In fact, the Ministry of Internal Affairs had, and still has, a much wider responsibility in the struggle against drinking (*Resheniia* . . . 1974, pp. 91-94). The MVD operates thousands of so-called "medical sobering-up stations" and "labor-medical camps", prison-like institutions for unreformed heavy drinkers. It plays a major role in collecting and analyzing data alcohol consumption in the country and in designing measures to control alcohol abuse.

The emphasis on punitive measures stem from the basic attitude of the central authorities towards drinking and alcoholism. Alcohol dependence is not considered a disease but a manifestation of moral weakness and character degradation. This attitude is slowly changing, and some medical specialists and others in authority begin to recognize alcoholism as a disease, but so far these people are in a minority (Roman and Gebert 1979). Thus the goals and the main concern of policymakers always was with law and order and with the elimination of the adverse effects of drinking on work ethics and productivity.

As the data summarized above testify, the periodic anti-drinking campaigns of the last 30 years had no effect, and heavy drinking and alcohol abuse and their negative effects on health and the quality of life in the USSR continued to increase. Probably one of the most important factors affecting this phenomenon is that, contrary to all explicit declarations of the government, production and import of alcoholic beverages continued to increase throughout this period. Between 1958, i.e., the year of Khrushchev's first anti-drinking campaign, and 1984, production of vodka doubled and pro-

duction of wine increased six-fold (Trembl 1982, p. 5; Narkhoz 1985, p. 254). In the same period, net imports grew from less than 0.05 to 0.6 liters of absolute alcohol per person. It should be added that during these years the alcohol content of wines was boosted by increasing fortification. In some years production or imports of specific beverages were down, but almost without exception these cuts were not related to policy decisions but to temporary shortages of raw materials available to the industry, such as grain or potatoes for alcohol, or grapes for wine making and, in the case of imports, to increases in world market prices. The only possible explanation of this obvious inconsistency between policy declaration and practice lies with the huge revenues generated by liquor trade, which ultimately carried the day with policymakers. Considerations of short term fiscal expediency thus always dominated at the expense of the long term potential benefits to be derived from temperance.

As Gorbachev assumed the leadership in early 1985, the alcohol problem was thus clearly out of control, and the record of state anti-drinking policies was dismal.

3. GORBACHEV'S CAMPAIGN

The new General Secretary's anti-drinking campaign was launched in May 1985, with the announcement of several far reaching measures intended to reduce drinking and alcohol abuse by restricting and controlling consumption of alcoholic beverages and by expanding and increasing penalties for drinking (Pravda, May 17, 1985, p. 1 and Stolbov, ed. 1985). Under the first we should mention raising the minimum legal age for drinking to 21, restricting the hours of sale of alcohol from 2 to 7 p.m., cutting down the number of outlets selling alcohol, directing a gradual reduction in the production of vodka and a complete phasing out of fruit wines by 1988. New penalties were introduced and existing penalties were increased (often doubled and tripled) for drinking on the job, being drunk in public, drunken driving, allowing subordinates to drink on the job, violations of regulations in liquor trade, and for home production, sale, or consumption of samogan. Three months after the start of the campaign, prices of alcoholic beverages were raised by 15-25 percent and were raised again by 20-25 percent one year later. In this regard the new campaign did not offer anything that had not been done or promised in previous campaigns: as before Gorbachev's anti-drinking program consisted in raising prices and in introducing increased penalties and new restrictions.

There have been, however, some new and positive elements. The rhetoric that characterized earlier campaigns was replaced by a more somber tone, and the failure of earlier policies were implicitly recognized. One particularly interesting new element was the tacit recognition that the boredom of everyday life and the absence of adequate relaxation, rest, and entertainment facilities was one of the main reasons for heavy drinking. The authorities announced several steps designed to improve the situation, such as the expansion of athletic facilities and increased production of home tools and crafts. A major expansion of soft drink and fruit juice production was promised both as a replacement for alcoholic beverages in

public eating outlets and as a way of absorbing the anticipated growth of cash not spent on alcohol.

Another novel element was the increasing flow of published information concerning alcohol. There had in the past been no dearth of published articles and monographs describing the dangers of drinking. For a long time, however, an almost total blackout had been imposed on the publication of general information on production and consumption of alcoholic beverages and on summary information on the extent of alcohol abuse, such as statistics on arrests on drunks, alcohol related mortality, and the like. Reflecting Gorbachev's call for "glasnost," or openness, the official sources began publishing statistics on alcohol that had not been available since the mid-1950s.

In contrast to the past, the May 1985 campaign did not fizzle out in a few months and the new restrictions and policies are being enforced with vigor. Central authorities continue to monitor the progress of the campaign, with successes and failures periodically reported in the media. Party members lose their cards and officials are fired for excessive drinking, while those caught drinking on the job are arrested.⁵ The MVD police apparatus has been mobilized in an all-out attack on alcohol abuse. The police have engaged in sweeping searches and confiscations of samogon, stepped up arrests of drunks in the streets and in work places, expanded checks for drunken driving and for violations of regulations in liquor trade. They keep order in long and unruly liquor store lines, stop minors from buying alcohol, and watch for liquor speculators.

Production of alcoholic beverages has been relentlessly cut, vodka and wine factories are being closed down, grapevines are being destroyed. In one year production of vodka was cut by 33 percent; of grape wine, by 32 percent; of fruit wine, by 68 percent; and of cognac, by 44 percent (Korolev 1986, p.3). Cuts of similar magnitude continued in 1986 and 1987. More than half of all stores were ordered to close their liquor departments and many restaurants stopped serving alcohol.

Consumption of state-produced alcoholic beverages declined dramatically, as can be seen from the following statistics:⁶

Absolute alcohol per person 15 years old and older, liters

1980.....	11.5
1984.....	11.2
1985.....	9.9
1986.....	5.8

A special survey of 5,000 families undertaken at the end of 1985 indicated that 12 percent of the respondents stopped drinking completely, 36 percent reduced their consumption, and 52 percent continued drinking at the same level (Kogai and Kokorina 1986, p. 14).

⁵ We do not know the overall number of arrests or dismissals but judging from a sample of reports it must be large. For example, in two months 700 people (half of them officials) were arrested for drinking on the job in Estonia (*Sotsialisticheskaya zakonnost'*, No.10, 1986, p. 34; 455 party officials were reprimanded and 74 were expelled in Vinnitsa oblast' (*Pravda*, September 24, 1985, p. 3); in the Ul'ianovsk oblast' 183 were expelled from the party for drunkenness (*Trud*, February 20, 1986, p.2); 330 teachers from 47 technical schools were penalized for drinking (*Uchitel'skaya gazeta*, September 25, 1986, p. 2).

⁶ The data for 1980, 1984, and 1985 are from *Narkhoz* 1985, p. 609, recomputed to reflect population of 15 years old and older. The figure for 1986 is from *SSSR v tsifrakh*, 1986, p. 267.

Unfortunately, very little information about the survey and its reliability is known, but rough estimates based on the article describing it suggest that those who reduced their drinking had cut their intake of alcohol by about 23 percent.

The drastic cuts in production and sales of alcoholic beverages produced significant revenue losses for the state budget. In the six months after the start of the campaign the losses probably amounted to more than 6 billion rubles⁷ and this happened despite the hefty price boosts posted in August of 1985. The poor state of financial planning of the anti-drinking campaign was particularly evident in 1986. The budgetary plan for 1986 provided for tax revenues of 102.6 billion rubles. The plan was drawn up in late 1985 and thus should have reflected financial consequences of reduced alcohol sales (Dementsev 1986, p. 6). In July, 1986, Gorbachev said that sales of alcohol were down 35 percent and because of this the budget lost 5 billion rubles but the authorities were prepared to deal with the loss (Pravda, July 27, 1986, p. 3). Five days later, however, the prices of alcoholic beverages were raised by 20-25 percent (Pravda, August 1, 1986, p. 3). These price increases could not have been justified by the need to discourage drinking because alcohol sales were already decreasing, so the only explanation seems to lie with fiscal considerations. Despite the planning and the price boost the actual tax revenues in 1986 were 92.2 billion rubles, indicating an unanticipated loss of 10.4 billion rubles (Gostev 1986, p. 3). To place this value in a proper perspective, it might be mentioned that total budgetary expenditures on health in 1985 were 17.6 billion rubles (Narkhoz 1984, p. 559).⁸ The anti-drinking campaign is thus having a major destabilizing effect on state finances.

Unlike his predecessors, however, Gorbachev has not allowed fiscal constraints to interfere with his campaign, at least not so far.

The figures shown above indicate that, in the first full year following the beginning of the campaign, the average consumption of alcohol compared with that of 1984 was reduced by half. According to numerous Soviet media reports, these rather impressive results have produced equally impressive improvements in a number of social indicators associated with alcohol abuse. We cannot draw a comprehensive picture of these improvements because the available statistics are presented as percentages, refer to poorly defined categories, and often are not consistent with one another. The data summarized below were culled from a variety of Soviet sources and refer either to the June 1985-June 1986 period or to the first six months of 1986 compared with the pre-campaign period. Thus, the campaign produced the following results:

	Percent
Crime generally.....	down 20-25
Traffic accidents caused by drunken drivers.....	down 20-22
Traffic injuries and deaths.....	down 20-22

⁷ Estimated roughly as the difference between tax revenues of 103.1 billion rubles which were planned before the start of the campaign (*Finansy SSSR*, No. 1 1985, p. 5) and the actual collections of 97.7 billion rubles (*Narkhoz* 1985, p. 6). Losses from reduced taxes on profits of the alcohol industry and of the retail trade network cannot be estimated.

⁸ One of the reasons for the unanticipated losses was the naive belief of the authorities that increased sales of fruit juices, soft drinks, and other consumer goods produced from "hidden inner reserves" would somehow cover some or most losses in sales.

Fatal accidents caused by drinking	Percent
In the work place	down 20
In the home	down 8
Loss of time caused by absenteeism in industry	down 33
Loss of time caused by absenteeism in construction	down 40

In addition, different reports have indicated decreases in mortality from cardiovascular problems associated with alcohol; in divorces caused by drinking of one of the spouses; in cases of rape, hooliganism and other forms of street crime.⁹

Generally speaking, in 1985 and 1986 the economy performed somewhat better than in the early 1980s, but we do not have sufficiently detailed data to relate the increases in labor productivity and other economic improvements to the anti-drinking campaign. It should be noted, however, that Gorbachev and other key leaders so far have not attributed major economic improvements to the campaign.¹⁰

4. RESULTS: AN INTERIM ASSESSMENT

It is too early to offer an overall evaluation of Gorbachev's anti-drinking campaign since we can look only on the evidence of direct short term results, some of which may not be lasting and some of which may be subject to varying interpretations. The ultimate test of the success of the program introduced in May, 1985, will lie in long term changes. In the meantime it is only possible to comment on certain aspects of the results that have been reported.

For a number of reasons, the benefits of the remarkable 50 percent drop in the per capita consumption of state-produced alcoholic beverages should be interpreted with caution.

In the first place, it should be noted that some of the beneficial results of reduced consumption of alcohol are probably exaggerated by officials eager to please higher authorities.¹¹

The main point to be kept in mind is that heavy drinking and alcohol abuse are highly complex and multidimensional phenomena which cannot be eliminated or even significantly modified in a span of a couple of years by a program of relatively crude punitive measures, restrictions, and propaganda. The experience of many countries, including Russia, strongly suggests that the observable modification of drinking behavior achieved by such measures results in an emergence of unexpected negative effects in other spheres of social life. Accordingly, such undeniably positive results of the campaign as the reduction in per capita consumption of alcohol or the reduced accident statistics should not only be evaluated

⁹ An example of inconsistencies among reports can be seen in the following. According to MVD statistics reported on Moscow television on June 26, 1986, crime among minors was down 30 percent (JPRS-USR-86-042, August 25, 1986, p. 49). However, according to a report in *Izvestiia* on September 10, 1986 there was no appreciable change in crime committed by minors. Sources for the statistics summarized above are: *Treznost' i kul'tura*, No. 8, 1986, p. 2 and No. 9, 1986, p. 4; *Pravda*, July 27, 1986, p. 3; *Izvestiia*, October 12, 1986, p. 2; Moscow TASS in English, December 26, 1986; Beijing Xinhua reporting from Moscow, December 3, 1986, FBIS.

¹⁰ Statistics showing economic improvements in 1985 and 1986 contain a number of puzzling inconsistencies and it is quite possible that they are being manipulated to present Gorbachev's leadership in a more favorable light. This was first brought to my attention by Prof. Gertrude Schroeder. See also Vanus 1986 and Hanson 1986.

¹¹ For a sample of reports exposing inflated results of the campaign see *Trud*, August 16, 1985, p. 5 and August 14, 1986, p. 2; *Vozdushnyi transport*, April 8, 1986, p. 4.

in themselves but also balanced against unfavorable side effects of the campaign.

It is quite clear, for example, that stiffer penalties and increased controls have reduced drinking in the workplace and, consequently, the level of industrial accidents. It should be noted, however that these pressures have also resulted in increased labor mobility as workers fired from or fined at one job move on the another (Trud, December 4, 1985, p. 2).

Reinforced police patrol and stiffer penalties have reduced the level of disorder caused by drunks in the streets and of certain types of crime. Numerous reports indicate, however, that drinkers have moved from the streets into the homes, resulting in more wife and child abuse and more property destruction (Nedelia, No. 16, 1985, p. 5; Trud, March 19, 1986, p. 2, June 10, 1986, p. 2, October 13, 1986, p. 2; Pravda, July 7, 1986, p. 7; Vlasov 1987, p. 2).

According to some reports, even such an apparently beneficial change as the cut in alcohol-related accidents and traumas has some negative side effects. To avoid the newly introduced penalties, some drinkers who suffered accidents now delay seeking medical assistance until they have sobered up. In some cases the delay in treatment aggravates the condition of the patient (Trud, May 11, 1986, p. 2).

One of the most important factors which will affect the outcome of the campaign is the samogon, market.

The stepped-up police attack on samogon resulted in a 2.6 increase in the number of arrests of samogon makers, in confiscation or voluntary surrender of 900,000 pieces of distillation equipment and of 2.6 million liters of the brew (Vlasov 1987, p. 2). Despite all these efforts the available evidence indicates that home production of alcohol has grown (Pravda, June 10, 1986, p. 2; Trud, July 25, 1986, p. 2; Izvestiia, September 10, 1986, p. 3). Deep cuts in output and new restrictions on sales of state produced beverages created favorable conditions for an expansion of the underground market. The two price boosts pushed the price of vodka to 18.50 rubles per liter—a clearly excessively high price considering the average pay of about 1.25 rubles per hour. The higher price of state produced vodka made it possible for the black market to boost the price of samogon and also provided the drinkers with an additional incentive to distill samogon for home use.

Estimating the increase in illegal home production of alcohol is very difficult, and the following figures are offered here as first approximations only. In 1986, sales of sugar, the main input into samogon-making, increased by 10 percent (Pravda, January 15, 1987, p. 3). Major cuts in state procurement of grapes and fruit left rural areas with plentiful supplies which could not be easily marketed because of perennial shortages of transport, warehouse space and refrigeration facilities. Thus, rural areas had the necessary raw materials for home wine-making.

According to the Deputy Minister of the MVD illegal sales of alcohol, presumably samogon, increased by 42 percent in the first ten months of 1986 while home production of wine tripled (Zabotin 1986). Depending on assumptions, this statement could mean that per person 15 years old and older consumption (which we equate

with production) of *samogon* increased by 1.3 to 1.8 and of home-made wine by 0.75 to 1 liter of absolute alcohol.¹²

These are only rough estimates but it seems reasonable to conclude that the reduction in consumption of state produced alcoholic beverages was covered to a large extent by increased drinking of *samogon* and of other home-made beverages. In fact, some Soviet specialists say that the reduction of state produced beverages was fully compensated by *samogon* (Trud, April 21, 1987, p. 4; *Komunist*, No. 11, 1987, p. 37).

The most desperate drinkers were switching to alcohol surrogates such as aftershave lotions, colognes, and technical fluids containing alcohol. Runs on lotions and alcohol-based medicine have become so common that stores restricted sales to two bottles per customer, reduced the hours of sale, or had to call in police to control unruly buyers (*Izvestiia*, January 31, 1986, p. 3; *Literaturnaia gazeta*, November 12, 1986, p. 12). More harmful was the increased drinking of stolen technical alcohol, antifreeze, methanol, and other toxic fluids. Not surprisingly, the number of fatal alcohol poisonings is growing. Thus we read of five deaths from methanol in one factory (*Izvestiia*, September 12, 1985, p. 4), or about a case in which 32 people were poisoned and 15 died from drinking antifreeze (*Literaturnaia gazeta*, September 17, 1986); 200 people died in 90 cases of group poisoning (Vlasov 1987, p. 2).

The underground market also helped the Soviet consumer to circumvent the restrictions on sales of state-produced beverages, with ubiquitous middlemen (often taxi drivers) buying cases of vodka and then reselling them at a premium during off hours, in restricted areas, or to minors (*Nedelia*, No. 44, 1985, p. 71; *Izvestiia*, January 10, 1986, p. 3; Trud, September 5, 1986, p. 2).

Another important and possibly an interrelated problem is the use of narcotics in the USSR. There had been many similarities in the state policy towards alcohol and drug abuse. As with alcohol the official line was that the use of narcotics in the USSR is minimal and the medical authorities felt justified in neglecting the problem.¹³ Responding to Gorbachev's demands for *glasnost*, the veil of silence was lifted, and the media now report that the use of narcotics in the country is widespread and rapidly growing. What is of particular concern to authorities is that higher prices and restrictions placed on sales of alcoholic beverages have induced some drinkers to switch from alcohol to narcotics. The relationship between alcohol and narcotics is very complex, and the Western experience does not indicate a strong substitutability between the two

¹² Consumption of *samogon* in 1983 was estimated by the author as 4.2 liters of absolute alcohol per person (Tremi 1986, p. A34). In the 1980s consumption was increasing at about 5.6% per year and we will estimate 1984 consumption on the basis of this rate as 4.4 liters. It is impossible even to guess how the *samogon* market changed in the second half of 1985. Police became more active and the penalties were increased and this may mean that the production was cut. On the other hand, the shift in demand and higher prices of vodka may have induced higher production. We will use a range of 4.0 to 4.4 liters per person for the whole of 1985. The 42% increase referred to above would then mean that per capita consumption in 1986 grew to between 5.7 and 6.2 liters of absolute alcohol. Estimation of home production of wine was done in a similar fashion.

¹³ One of the better known journalists writing on medical themes, Balaian, said in a recent article (1986, p. 13) that for a long time newspapers would not accept reports on drug use because the topic was prohibited. He also cites a methodological recommendation issued by the Ministry of Health stating that in the USSR "use of narcotics does not pose a serious problem".

substances. The Soviet authorities, however, claim that the increased use of narcotics is, at least in part, the result of the anti-drinking campaign (Moskovoi 1986, p. 3; Komin 1986, p. 3; Potapov 1986, p. 11).

Most of the benefits of reduced drinking and alcohol abuse summarized above are real but they must be balanced against the undesirable effects such as increased production of homemade alcohol, switching to narcotics, and other phenomena described above. These represent real economic and social costs which were not anticipated in the hastily drawn program of the campaign but which are now becoming more visible.

What are the prospects for the future?

There is no doubt that, generally speaking, a carefully prepared and monitored anti-drinking program that provides for a gradual reduction in production of alcoholic beverages, restrictions on their distribution, strict rules controlling drinking, and a continuing educational and propaganda efforts will bear fruit in a long run. There are, however, several reasons to question the overall effectiveness of Gorbachev's campaign and the ability of the authorities to maintain its momentum.

One aspect of the campaign must be discussed at this point. For years Soviet specialists have been debating the question of the acceptable level of drinking. Most of the professionals, i.e., sociologists, psychiatrists, and journalists specializing in medical issues, felt that the goal of total abstinence or an introduction of a "dry law" in the Soviet Union was unrealistic. They suggested that most ill effects of alcohol abuse in the country would be eliminated if the drinkers were to learn how to drink in moderation and in a civilized manner, spreading alcohol intake over time and combining it with food. The opponents took the rather dogmatic position that any quantity of alcohol consumed under any circumstances is harmful to the society and the individual and that the goal of the state policy should be total abstinence. The Central Committee resolution set the tone for the whole campaign by rejecting the "civilized, moderate drinking" and the media made total abstinence the main theme of the propaganda "blitz". The notion of moderate drinking is being ridiculed in an article after article and its earlier supporters are being harshly criticized. Gorbachev's insistence on openness notwithstanding, the genuinely free discussion of this issue ceased. Proponents of moderate drinking such as Boris and Mikhail Levins, E.A. Babaian, and Z. Balaian who had been expressing alarm over the alcoholism for years and who made major contributions to the understanding of the alcohol problem, have been silenced. As a matter of fact, the attack on the moderate drinking position is becoming more and more of a witch-hunt. In this connection the name of a Leningrad surgeon, Fedor Uglov, should be noted. Uglov was long known as an outspoken critic of drinking but because of his extreme views, his naive approach to this highly complex problem and the lack of professional expertise he was virtually ignored by serious specialists. Uglov has today emerged as the main spokesman for the total-abstinence position and is advocating his views and attacking the now silent opponents in a style reminiscent of Lysenko.

Most specialists would probably agree that this strategy, particularly when combined with crude punitive measures, is wrong and that the only long term solution to the alcohol problem in a country such as the USSR, with deeply rooted traditions of drinking, is a slow educational process leading to moderation and temperance.

The tacit acknowledgement, made in the initial announcement of the campaign, that the boredom and drabness of everyday Soviet life contributes to the spread of drinking was a sign of progress in a society which has long denied the existence of social conditions leading to drinking. The increased production of hobby kits, automobile spare parts and expansion of athletic fields ordered by the authorities is by far not a comprehensive solution. The state would have to address the needs for adequate housing and of the whole infrastructure of entertainment, leisure, and rest facilities. Development of such programs would take years and would be costly and, judging from current economic plans, this is not where Gorbachev's priorities lie.

The fiscal problems have not been resolved. The fiscal folly of a significant dependence of the state on liquor revenues is now obvious. The budget is losing revenues while increasing cash holdings and savings of the people contribute to the hidden inflation and adversely affect labor incentives. Only a most comprehensive tax, wage, and price reform could resolve these issues and so far there has been no evidence that one is being considered.

In the frenzy of the campaign's condemnation of drunkards and exposing of the evil of alcohol, the public health issues have been somewhat neglected. The basic attitude of central authorities did not change much; alcoholism is seen as a moral weakness, and the state's responsibility is seen in insuring the law and order in the streets and in the workplace and not in financing of an expansion of treatment facilities. The newly created network of narcological clinics is in part funded by enterprises and organizations and in part by paying patients but not by the state budget. It would appear to a Western observer that the anti-drinking program cannot be successful in the long run without a major commitment of public health support for counselling, psychiatric treatment, post-treatment assistance and rehabilitation.

Illegal home production of alcohol is and will remain the main threat to the success of the campaign. Past Soviet experience shows that it is virtually impossible to eliminate samogon. The technique of production is very simple and does not require elaborate equipment, and the raw materials such as sugar, flour, grain, potatoes, or fruit are widely available and inexpensive relative to state-produced alcohol. And, unlike their American counterparts, Soviet samogon makers are small scale producers without large stills, which makes police detection difficult. About the only feasible method of elimination of samogon is to make it unprofitable by fixing prices of state produced alcohol at a sufficiently low level, a method that is unlikely to be adopted. In recent months the Minister of Internal Affairs, A. Vlasov, has been reporting the frustrations experienced by the police in their struggle with increasing illegal production noting that mere increases in penalties cannot be equated with effective anti-alcohol measures (1987, p. 2).

The whole campaign was clearly designed in haste without considering all possible consequences and with naive expectations of immediate and dramatic improvements in labor discipline and in disappearance of adverse effects of drinking. So far, Gorbachev displayed a remarkable degree of zeal in maintaining the momentum of the campaign in the face of what must be a considerable opposition. In this regard he displays much more confidence in his power and more perseverance than his predecessors. In all probability, though, the real economic and social costs will continue to rise while the potential benefits, which are still quite uncertain, will not be felt for years. It is possible that facing these problems Gorbachev will be forced to modify the anti-drinking program by introducing more modest goals.

BIBLIOGRAPHY

The bibliography includes only sources of general interest and broader in scope. Short media reports of single instances or cases are cited in the text but not listed here.

- Balaian, Z., *Literaturnaia gazeta*, December 3, 1986, p. 13.
 Bazhenov, G., *Literaturnaia gazeta*, May 29, 1985, p. 11.
 Connor, W.D., "Alcohol and Soviet Society," in *Beliefs, Behavior, and Alcoholic Beverages*, edited by M. Marshall, Ann Arbor, 1979.
 Dementsev, V., *Finansy SSSR*, No. 1, 1986, p. 6.
 Feshbach, M., *The Soviet Union: Population Trends and Dilemmas*, Population Bulletin, Vol. 37, No. 3, August, 1982.
 Feshbach, M., "Social Dynamics in the USSR," in *Soviet Politics in the 1980s*, H. Sonnenfeldt, ed. Boulder, 1985, pp. 41-55.
 Field, M. and D. Powell, "Alcohol Abuse in the Soviet Union," *The Hastings Center Report*, 1981.
 Gostev, B., *Izvestiia*, November 18, 1986, p. 6.
 Hanson, Ph., "Puzzles in the 1985 Statistics," *Radio Liberty Research Bulletin*, 439/86, November 20, 1986, pp. 1-4.
 Keller, M. and V. Efron, "Alcohol Problems in Yugoslavia and Russia," *Quarterly Journal of Studies on Alcohol*, Vol. 35, 1974, pp. 260-271.
 Komin, A.N., *Komsomol'skaia Pravda*, August 13, 1986, p. 3.
 Korolev, M.A., *Izvestiia*, October 12, 1986, p. 3.
 Korgai, R. and T. Kokorin, *Sovetskaia trgovlia*, No. 8, 1986, pp. 13-14.
 Moskovoi, A., *Komsomol'skaia Pravda*, June 8, 1986, p. 3.
 Lisitsyn, Iu. and N. Kopyt, *Alkogolizm*, 2nd ed., Moscow, 1983.
Narodnoe khoziaistvo SSSR v 1985 godu, Moscow, 1986.
Narodnoe khoziaistvo SSSR v 1984 godu, Moscow, 1986.
 Potapov, A.I., *Literaturnaia gazeta*, August 20, 1986, p. 11.
Resheniia partii i pravitel'stva po khoziaistvennym voprosam, Vol. 9, 1974.
 Roman, P.M. and P.J. Gebert, "Alcohol Abuse in the US and the USSR: Divergence and Convergence in Policy and Ideology," *Social Psychiatry*, Vol. 14, 1979, pp. 207-216.
 Segal, B., "Drinking Patterns and Alcoholism in Soviet and American Societies," in *Psychiatry and Psychology in the USSR*, edited by S. Corson and E. Corson, New York, 1976, pp. 181-265.
Spravochnik partiinogo rabotnika, Vol. II, Moscow, 1959.
 Stolbov, B.A., ed., *Zakonodatel'stvo o bor'be s p'ianstvom i alkogolizmom*, Moscow, 1985.
 Strumilin, S. and M. Sonin, *Ekonomika i organizatsiia promyshlennogo proizvodstva*, No. 4, 1974, pp. 36-44.
 Treml, V., (a) "Death from Alcohol Poisoning in the USSR," *Soviet Studies*, Vol. XXXIV, October, 1982, pp. 487-505.
 Treml, V., "Alcohol Abuse and Quality of Life in the USSR," in *Soviet Politics in the 1980s*, edited by H. Sonnenfeldt, Boulder, 1985, pp. 55-56.
 Treml, V., *Alcohol in the USSR: A Statistical Study*, Duke University Press, Durham, NC 1982.
 Treml, V., (a) "Alcohol in the Soviet Underground Economy," *Berkeley-Duke Occasional Papers on the Second Economy in the USSR*, No. 7, Durham, NC, December, 1986.

- Treml, V., *Alcohol Abuse and Quality of Life in the USSR* (Study prepared for Georgetown University Project on Quality of Life in the USSR), manuscript, forthcoming, 1986.
- Vanus, J., "Soviet Economic Performance during the First Half of 1986", *PlanEcon Report*, Nos. 32-33, Vol. II, August 14, 1986, pp. 1-20.
- Vlasov, A., *Izvestiia*, March 11, 1987, p. 2.
- Vozdushnyi transport*, April 8, 1986, p. 4.
- Zabotin, B. Central TV Program, Moscow, December 2, 1986, PM. As reported in English, Beijing, Xinhua, December 3, 1986 (FBIS Okinawa).
- Zaigraev, G., *Sotsiologicheskie issledovaniia*, No. 4, 1983, pp. 96-105.
- Zaigraev, G., *Sotsiologicheskie issledovaniia*, No. 4, 1985, pp. 47-54.

DEVELOPMENTS IN THE HEALTH SECTOR OF THE SOVIET ECONOMY, 1970-90

By Christopher Mark Davis*

CONTENTS

	Page
I. Summary.....	312
II. The Health Sector and Health Production Process in the USSR.....	313
III. Developments in the Soviet Health Sector: 1970-85	315
A. Health Conditions, Illness and Consumer Demand	315
B. The Medical System	316
C. The Medical Supply System	318
D. The Medical Industry	320
E. Medical Foreign Trade	322
F. Final Health Output	324
IV. Health Sector Policy and Plans Under Gorbachev: 1986-90	326
A. Perestroika in the Health Sector	326
B. Changes in Personnel and Labor Policy	327
C. Changes in Organization and the Economic Mechanism.....	328
D. The 12th Five Year Plan for the Health Sector	330
V. List of References.....	332

I. SUMMARY

The improvement in the health of the population is officially identified as a high-priority task for party and state organizations in the USSR. The CPSU program claims that health improvement is a "matter of prime importance" and at the 27th CPSU Congress General Secretary Mikhail Gorbachev stated that for both the individual and society "there is nothing more valuable than health".¹ Despite the apparent importance attached to the task of health improvement by the Soviet regime, however, the USSR experienced rising age-specific mortality rates and declining life expectancy during the period 1970-85. These trends were unusual by international standards and reflected serious performance problems throughout the health sector. Among these were: excessive consumption of alcohol and tobacco by households; low quality of preventive and curative medical services; inappropriate distribution of medical supplies by pharmacies; insufficient production of pharmaceuticals and equipment by the medical industry; a sluggish pace of technological innovation in medical products; inadequate imports of medicines; and deficiencies in planning and management by central health authorities. Rectification of these health sector deficiencies

*Centre for Russian and East European Studies, University of Birmingham, Birmingham, England.

¹ Programma 1985 and XXVII 1986, pg. 71.

cies has been one of the challenges confronting the Gorbachev government.

The objectives of this paper are to analyze past performance of the Soviet health sector and to evaluate health policy since Mikhail Gorbachev became General Secretary. Section II argues that changes in the health of the Soviet population are generated by the activities and interactions of the seven institutions comprising the health sector of the economy: households, medical system, medical supply network, medical industry, biomedical research and development (R&D), medical foreign trade, and central health bureaucracy. Section III presents summary analyses of the organization and performance of Soviet health sector institutions during 1970-85 as well as of mortality and life expectancy trends. Section IV identifies the numerous policy changes and reforms affecting the health sector that were introduced by the Gorbachev regime from March 1985 to February 1987, outlines the 12th Five Year Plan for the health sector, and assesses likely developments in the period out to 1990.

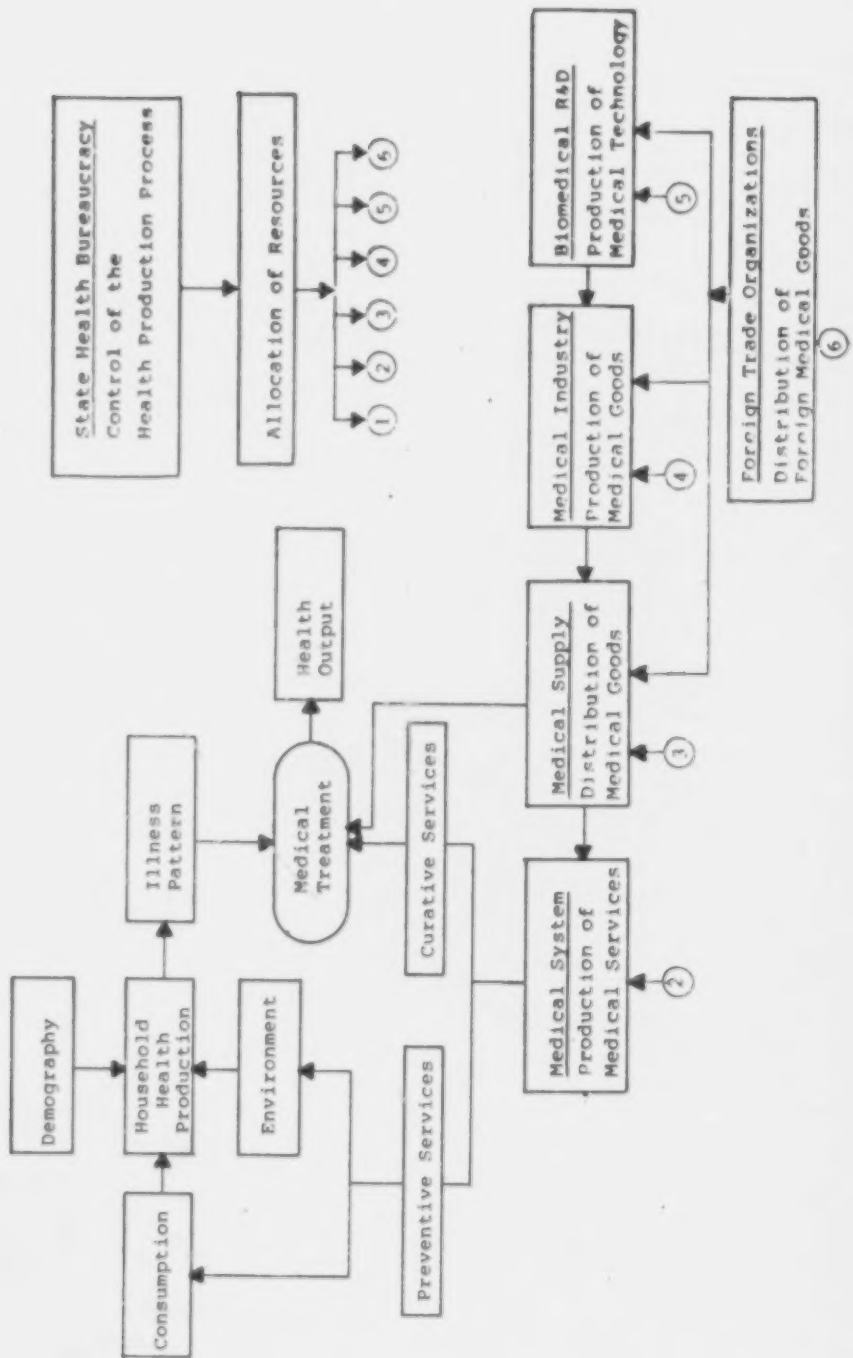
II. THE HEALTH SECTOR AND HEALTH PRODUCTION PROCESS IN THE USSR

The Soviet Union attempts to improve the health of its population for a variety of reasons that range from a desire to enhance individual welfare to pragmatic concern about raising national labor productivity. This objective is difficult to attain, however, because changes in health are produced by a complex process involving the interaction of demographic, consumption, environmental, medical, political and economic variables, and the activities of a variety of institutions.

The production of health in the USSR is carried out primarily within the health sector of the economy.² This sector is made up of seven institutions: consumers (households), medical system, medical supply network, medical industry, biomedical research and development, medical foreign trade, and the central health bureaucracy. Each of these economic institutions produces measurable outputs and uses inputs of labor, capital and intermediate goods. Their activities include production of health by households, production of medical services and pharmaceuticals, distribution of medical commodities, and administration. Furthermore, the health sector institutions function in a co-ordinated manner as components of a process that has the final objective of improvement in the health of the population. Diagram 1 summarizes the main features of the Soviet health production process.

² Detailed definitions and analyses of the Soviet health sector and health production process are presented in Davis 1979, 1981, 1984.

Diagram 1: The Health Production Process in the USSR



III. DEVELOPMENTS IN THE SOVIET HEALTH SECTOR: 1970-85

This section presents summary assessments of developments in the Soviet health sector during 1970-85 in accordance with the model of health production shown in Diagram 1.³ It begins with an evaluation of recent trends in health conditions, illness and consumer demand. This is followed by analyses of four health sector institutions: medical system, medical supply network, medical industry, and medical foreign trade. Due to space constraints biomedical R&D and the central health bureaucracy are not examined directly. Finally, the dynamics of mortality and life expectancy during 1970-85 are analyzed.

A. HEALTH CONDITIONS, ILLNESS AND CONSUMER DEMAND

Changes in health conditions during 1970-85 influenced the evolution of the illness pattern and the demand for medical care in the USSR. Health-related demographic developments included an increase in the size of the Soviet population from 242 to 276 million, a significant growth in the number of elderly, and a small rise in the share of males. There were several positive developments in consumption, exemplified by increases in retail sales and improvements in the diet and educational standards of Soviet citizens.⁴ On the negative side, there was substantial growth in the consumption of alcohol and tobacco products and the intake of dietary cholesterol.^{5,6,7} There were deficiencies in the nutritional composition of artificial milk and baby food and the average citizen suffered from a 30-40 percent vitamin deficit.^{8,9}

Problems in the health environment contributed to illness as well. These included inadequate housing provision, low standards of public sanitation, the break-up of the extended family, excessively rapid mechanization and chemicalization of industry, increases in road traffic without adequate safety programs, growth in air and water pollution, and antigenic shifts in the influenza virus.^{10,11}

Preventive medical services in the USSR increased in quantity over the period, but they had limited effectiveness due to serious qualitative deficiencies.¹² As a result, the negative developments in health conditions generated growth in all four major categories of illness: degenerative; accidents; infections; and nutritional.

According to Murray Feshbach, infectious diseases in the USSR had a high incidence by Western standards and there were increases in the prevalence of typhoid and paratyphoid, diphtheria, whooping cough, measles, mumps, hepatitis and salmonellosis.¹³

³ This published article is a condensed version of the contribution that was originally submitted to the Joint Economic Committee. The full version of the paper is available from the author at the following address: CREES, University of Birmingham, P.O. Box 363, Birmingham B15 2TT, England.

⁴ Narodnoe 1985, pp. 27, 411, 445, 459.

⁵ Tremi 1982b.

⁶ Narodnoe 1985, pp. 470.

⁷ Cooper and Schatzkin 1982.

⁸ Davis and Feshbach 1980.

⁹ Chto 1986.

¹⁰ Davis 1981, 1986b.

¹¹ Davis and Feshbach 1980, Feshbach 1986.

¹² Utverzhdat 1986, Trudnye 1987.

¹³ Feshbach 1983, 1986.

Accidents and poisonings rose due to the rapid mechanization of Soviet society and growing consumption of alcohol.¹⁴ Rates of degenerative diseases went up because of the aging of the population, urbanization, stress, smoking, alcoholism, poor diet and pollution. The number of deaths per 100,000 from cardiovascular disease rose from 247 in 1960 to 535 in 1983 and from cancer from 115.5 in 1960 to 134.6 in 1975.¹⁵ The Soviet Union also had high incidences of nutritional disease, such as rickets, and respiratory illness, such as influenza and pneumonia.

The upward trends in illness rates increased the population's need for medical care. For a variety of reasons, only about two-thirds of cases of illness in cities and one-third in rural areas were presented to the medical system for treatment by doctors.¹⁶ Nevertheless this was sufficient to generate a substantial growth in the Soviet population's demand for medical care.

B. THE MEDICAL SYSTEM

The Soviet Union has a medical care organization with features that have been described and analyzed elsewhere by this author and others.¹⁷ In the period up to 1985 this medical system developed in accordance with an "extensive" strategy that called for the use of growing quantities of simple facilities, cheap labor, low technology and modest material inputs to generate large volumes of basic services.¹⁸ Table 1 shows that in the case of inputs, from 1970 to 1985 there were increases in the number of hospital beds from 2,663 to 3,608 thousand and in the number of doctors from 668.4 thousand (27.4 per 10,000 population) to 1,170.4 thousand (42.0 per 10,000). The medical system labor force increased from 4,923.6 to 7,235.5 thousand in this period.¹⁹ As usual, there were modest increases in supplies to the medical system of medicines, medical goods (bandages, vitamins, and thermometers) and items of a non-medical nature, such as fuel for buildings and food for patients.

For a variety of reasons the Soviet government has been able to constrain the growth in health spending to low rates by Western standards despite the population's rising demand for medical care.²⁰ Table 1 shows that although state budget health spending grew from 9.2 to 17.5 million rubles during 1970-85, the health share of the state budget dropped from 6.0 to 4.6 percent. Total spending almost doubled from 11.7 to 22.4 billion rubles but its rate

¹⁴ Trembl 1982a.

¹⁵ Davis 1977, Dutton 1979, Cooper 1981, Feshbach 1982, 1986.

¹⁶ The issues of need, the 'morbidity iceberg' and demand for medical care in the USSR are analyzed in Davis, 1979, 1984, 1986b. At the XVIII Congress of Trade Unions USSR in February 1987 Dr. Fedorov claimed that the Soviet medical system treated only '30 percent of those people who need it'. See Sluzhba 1987.

¹⁷ Field 1967, Kaser 1976, Ryan 1978a, Davis 1983, 1986b, 1987a.

¹⁸ In February 1987 Dr. Fedorov blamed many of the serious health problems in the USSR, such as low life expectancy and high infant mortality, on 'the unending, extensive growth of the health service'. Sluzhba 1987.

¹⁹ According to Davis 1983 pg. 241, the medical labor force is made up of doctors, middle medical, junior medical and other personnel. The 1970 and 1985 labor totals were calculated by adding to reported numbers of doctors and middle medical estimates of the other two categories made on the assumption that they respectively were 54 percent and 38 percent of middle medical personnel. The medical share of the national labor force rose from 5.5 to 6.1 percent.

²⁰ Davis 1987.

TABLE 1.—SOVIET MEDICAL SYSTEM RESOURCES AND OUTPUTS, 1970-85

Indicator	Year				1985 as percent of 1970
	1970	1975	1980	1985	
Facilities and Personnel:					
Hospitals (thousands)	26.2	24.3	23.1	23.3	89
Outpatient clinics (thousands)	37.4	35.6	36.1	39.1	105
Hospital beds (thousands)	2,663.3	3,009.2	3,324.2	3,607.7	135
Hospital beds (per 10,000 population)	109.4	117.9	124.9	129.6	118
Doctors (thousands)	668.4	834.1	997.1	1,170.4	175
Doctors (per 10,000 population)	27.4	32.6	37.5	42.0	153
Middle medical personnel (thousands)	2,123.0	2,515.1	2,814.3	3,158.9	149
Expenditures:					
State health budget (billion rubles)	9.2	11.4	14.7	17.5	190
Health share of total state budget (percent)	6.0	5.3	5.0	4.6	77
Non-budget sources (billion rubles)	2.5	3.1	4.1	4.9	196
Total expenditures (billion rubles)	11.7	14.5	18.8	22.4	191
Health expenditure per capita (rubles)	48	57	71	81	169
Health expenditure share of national income (percent)	4.1	4.0	4.1	3.9	95
Outputs:					
Outpatient visits plus doctor home visits (millions)	1,938.4	2,296.9	2,750.5	3,168.4	163
Outpatient visits per capita	8.0	9.0	10.4	11.4	143
Preventive screenings (millions)	101.3	106.9	112.5	123.2	122
Hospital bed days (millions)	828.3	962.9	1,063.7	1,162.1	140
Hospital bed-days (per capita)	3.4	3.8	4.0	4.2	124
Hospitalizations (millions)	52.2	57.3	62.7	69.6	133
Hospitalizations (per 100 population)	21.5	22.7	23.7	25.1	117

Sources: Hospital beds—Narodnoe 1985, pg.539. Outpatient clinics—ibid. Hospital beds (1,000)—Narodnoe 1980, pg.499; 1985, pg.544. Hospital beds (per 10,000)—ibid. Doctors (1,000)—Narodnoe 1980, pg.496; 1985, pg.540. Doctors (per 10,000)—ibid. Middle medical—Narodnoe 1980, pg.497; 1985, pg.541. State health budget—Take values for state budget spending on health and physical culture from Narodnoe 1985, pg.563 and subtract an estimated 70 million rubles for physical culture in 1970, 1975, and 100 million rubles in 1980, 1985. Health share—Divide estimated state budget health spending by total state budget expenditure given in Narodnoe 1985, pg.559. Non-budget sources—Subtract 100 million rubles for 1970, 1975 and 200 million rubles for 1980, 1985 for physical culture from all-source spending on health and physical culture given in Narodnoe 1985, pg.561. From this subtract estimated state budget health spending. Total expenditure—Add state health budget and non-budget health spending. Health spending per capita—Divide total health spending by Soviet population given in Narodnoe 1980, pg.7; 1985, pg.5. Health share national income—Divide total health spending by national income utilized given in Narodnoe 1985, pg.411. Outpatient visits—1970, 1980, 1985 from Narodnoe 1985, pg.543; 1975 from Korchagin 1980, pg.92-93. Outpatient per capita—ibid. Preventive screenings—1970, 1980, 1985 Narodnoe 1985, pg.545; 1975 Korchagin 1980, pg.85. Hospital bed-days—1970-1975 Korchagin 1980, pg.92. It is assumed that the hospital bed utilization per year was the same as 1975 in 1980, or 320 days, and then rose to 322 in response to various efficiency campaigns. Multiply bed utilization in 1980 and 1985 by the number of beds given in row 3 to obtain the number of bed-days provided. Hospitalizations (millions)—1970, 1980, 1985 Narodnoe 1985, pg.543; 1975 Korchagin 1980, pg.87. Hospitalizations (per 100)—ibid.

of growth declined from 6 percent per annum in 1975-80 to 4 percent in 1980-85. Success in the cost containment effort was also reflected in the slight decline in the health share of national income.

As is evident from Table 1, the Soviet medical system produced increasing amounts of outpatient and hospital services. Although trends in these medical service output indicators in the USSR were uniformly favorable, they represented quantitative increases, not advances in the quality of medical care.²¹

A comprehensive evaluation of Soviet medical system performance involves the examination not only of inputs, expenditure and outputs but also efficiency, sufficiency, quality and distribution. In this section only a few comments are made on the issues of shortages and quality of medical care. More detailed assessments of these and other important subjects, such as tight financial constraints, second economy activity, and low technological levels are presented elsewhere.²²

The severe financial constraints imposed on the medical system, in combination with the general supply problems of the Soviet Union's shortage economy, led to pervasive deficits of all types of inputs: labor (total, by specialty and by region), building space, machinery, equipment, instruments, medicine and even basic commod-

²¹ Davis 1983, pp. 239-40.

²² Davis 1983, 1986b, 1987a and 1987b.

ities, such as bed linens.²³ For example, medical facilities did not normally have enough stocks of medicaments to satisfy their modest requirements. A recent article revealed that in the Erevan republican hospital, 126 medicaments out of the authorized list of 825 were in deficit.²⁴

These shortages adversely affected the provision of medical services to patients by the medical system. The inadequacies of medical buildings contributed to crowded waiting rooms, cramped work spaces for staff, location of diagnostic or treatment units in inappropriate areas, and violations of minimum sanitary norms of floor space per hospital bed. The deficits of personnel, caused in part by low wages, resulted in the substitution of nurses for doctors, queues of patients, and the reduction in average doctor consultation time. Pervasive shortages of medical equipment, machinery and instruments caused bottlenecks in the diagnoses and treatment of patients.

As a result of these problems the average quality of medical services in the USSR remained low relative to prevailing Western standards.²⁵ There were widespread reports of qualitative deficiencies such as: superficial, inaccurate diagnosis; tardy medical intervention and high risks of infection from hospital surgery; and poor care of patients in medical facilities, characterized by inattentive service by nurses and orderlies and bad food.

These deficiencies in medical system performance stimulated growing public dissatisfaction. According to Pravda, 66,000 letters of complaint were sent to the Ministry of Health in 1985, which was "significantly more than in the previous year", and:

People write that many hospitals are overcrowded, patients lie in corridors, there are not enough medical personnel or many medicines. In polyclinics there are queues, it is difficult to see specialists or to obtain diagnosis.²⁶

C. THE MEDICAL SUPPLY SYSTEM

The Soviet medical supply system provides medical facilities and the population with pharmaceuticals and medical technology. Pharmaceutical goods are distributed by pharmacies that are controlled by several ministries.²⁷ The Ministry of Health USSR administers most wholesale and retail pharmacies through its Main Pharmaceutical Administration (*Glavnoe Apteknoe Upravlenie*, or GAPU). Medical machinery and equipment, on the other hand, are supplied by a separate Ministry of Health organization, the All-Union Association for the Sale, Installation and Repair of Medical Technology, 'Soyuzmedtekhnika'.²⁸ Both GAPU and Soyuzmedtekhnika operate on a self-financing basis and try to make profits from their sales. In this section attention is focused on the operations of pharmacies.

²³ Davis 1983, 1987a.

²⁴ Zagalskii 1986.

²⁵ Knaus 1982, Feshbach 1986, Davis 1987a.

²⁶ Chernyak 1986.

²⁷ Gorenkov 1982, 1984; Krikov 1976; and Davis 1984, pp. 45-59.

²⁸ Gorenkov 1984, pg. 16.

The Soviet pharmacy system requires buildings, equipment, labor and intermediate goods to support its operations. In 1971 the facilities of the pharmacy network included 23,400 self-financing pharmacies, 266 pharmacy warehouses, 277 control-analytical laboratories, 570 pharmacy stores, 8,500 pharmacy kiosks, and 94,000 pharmacy points in rural areas.²⁹ As Table 2 indicates, from 1970 to 1985 the number of pharmacies increased by 27 percent, from 22,909 to 29,152. Over the same period the number of pharmacists rose from 167.8 to 271.3 thousand, or by 62 percent. In 1985 total employment in the pharmacy system was 493.3 thousand.³⁰ The estimated value of pharmacy network purchases of goods for sale grew from 1,233 million rubles in 1970 to 2,850 million rubles in 1985.³¹ In addition, pharmacies bought non-pharmaceutical goods and services to sustain their commercial activities.³²

TABLE 2.—THE SOVIET PHARMACY SYSTEM, 1970–85

Indicator	Year				
	1970	1975	1980	1985	1985 as percent of 1970
Pharmacies.....	22,909	25,256	26,593	29,152	127
Population per pharmacy (thousands).....	10.6	10.0	9.9	9.5	90
Pharmacists (thousands).....	167.8	207.4	239.9	271.3	162
Pharmacists per pharmacy.....	7.3	8.2	9.0	9.3	127
Total sales turnover (millions rubles).....	1,897.0	2,501.0	3,035.2	4,385.3	231
Retail sales (millions rubles).....	1,005.4	1,326.6	1,699.4	2,411.9	240
Wholesale sales (millions rubles).....	891.6	1,174.4	1,365.8	1,973.4	221
Sales of medicines (millions rubles).....	1,399.4	1,894.7	2,306.8	3,456.9	247
Medicine sales per capita.....	5.79	7.48	8.72	12.51	216

Sources: Pharmacies—1970, 75, 80 Narodnoe 1922–82, pg. 486, 1985 Shmakov 1986, pg. 2. Population per pharmacy—1970, 75, 80 Divide total Soviet population given in Narodnoe 1922–82, pg. 9 by row 1; 1985 Shmakov 1986, pg. 1. Pharmacists—1970, 75, 80, 85 Narodnoe 1985, pg. 539. Pharmacists per pharmacy—Divide row 3 by row 1. Total sales turnover—1970, 75 Tarasova and Semenova 1977, pg. 34 and Ryan 1978b, pg. 4; 1980 Prokopishin 1982 states that 1980 sales were 534.2 million rubles greater than those in 1975; 1985 Shmakov 1986, pg. 2 states that 1984 sales were 66.2% greater than those for 1975, or 4,156.7 million rubles. The 1985 figure was estimated by applying the average growth rate of the 1975–84 period of 5.5% to the 1984 figure. Retail sales—1975 Krikov 1976, pg. 62 states that planned retail sales in 1975 were 1.22 billion rubles out of a turnover of 2.3 billion rubles or 53%. Apply this percentage to actual turnover in 1975. 1970 Assume retail sales are 53% of turnover as in 1975. The 1965 share was 54% according to Tarasova and Lemenov, 1967, pg. 78. 1980, 85 Gorenkov 1982, pg. 90 states that 1979 retail sales were 55% of total turnover. Apply this percentage to 1980, 1985 turnover. Wholesale sales—Subtract retail sales from total sales turnover. Sales of Medicines—1970 Krikov 1976, pg. 54 says sales of medicines in 1970 were 5.79 rubles per capita. Multiply by 1970 population of 241.7 million. 1975 Prokopishin 1982, pg. 71 reports 1975 sales of 7.48 rubles per capita. Multiply by 1975 population of 253.3 million. See Heinemeier 1986, pg. 58 for a cross-check. 1985 Shmakov 1986, pg. 2 says that medicine sales in 1984 were 71.8% greater than in 1975. Therefore $1984 = 1,894.7 \times 1.718 = 3,255.1$. Multiply by annual average rate of growth for earlier period of 6%: $3,255.1 \times 1.062 = 3,456.9$. This represents 79% of total turnover. 1980 The medicine share of turnover in 1980 is assumed to be mid-way between 73% in 1975 and 79% in 1985, or 76%. Multiply turnover by this: $76 \times 3,035.2 = 2,306.8$. Medicine sales per capita—1970 Krikov 1976, pg. 54. 1975 Prokopishin 1982, pg. 71. 1980, 85 Divide medicine sales in these years by populations of 264.5 million in 1980 and 276.3 million in 1985.

Table 2 estimates that the total value of trade turnover rose from 1,897.0 million rubles in 1970 to 4,385.3 in 1985, or by a factor of 2.31. Pharmacy retail sales to the public grew more rapidly than wholesale trade with medical facilities and the retail share of turnover went up from 53 percent to 55 percent. The total value of medicine sales grew 2.47 times from 1970 to 1985 and on a per capita basis rose from 5.79 to 12.51 rubles.

²⁹ Krikov 1976, pg. 54.

³⁰ Batyunina 1985, pg. 66, reports that pharmacists make up 'a little over one-half of those employed. If one assumes this means 55 percent, then there were 220.0 thousand non-pharmacist employees.

³¹ Gorenkov 1984, pg. 192 indicates that trade overhead (*torgovoe nalozhenie*) is about 35 percent of total pharmacy turnover. The remaining 65 percent is accounted for by purchases of goods for sale. So the estimates represent 65 percent of 1970 and 1985 turnover figures.

³² Prokopishin 1982, pg. 72 reports that during 1976–80 GAFU spent more than 50 million rubles on furniture and equipment and purchased over 1,000 specialized automobiles.

The pharmacy system occupies a difficult position in the Soviet health production process because it is expected to satisfy the large and rapidly growing demands of the medical system and population but experiences recurrent difficulties in obtaining sufficient goods for sale from either the domestic medical industry or foreign trade organizations. There is ample evidence that during 1970-85 demand exceeded, and grew more rapidly than, supply.³³ As a result, there were pervasive shortages of medicaments. A 1985 article stated that:

In the Russian Federation there is a very difficult situation with respect to the provision of medical establishments and the population with medicaments and medical goods. Enterprises are fulfilling the orders of the health service on average by 70-75 percent. For a series of the most important and widely used medicines, the fulfillment is even lower: antibiotics 50-70%; fermented preparations 30-70%; preparations for treatment of cardiovascular illness 30-70%. It would be possible to continue this list, but is it worthwhile?³⁴

Shortages of medicines were evident at the local level in both wholesale and retail markets. Conditions of shortages were so common that pharmacies maintained lists of deficit products called the *defektura*. In 1976 the pharmacy administration of the Niko-layevskaya region (population: 1.2 million) had a seven-page *defek-tura* that listed 330 goods as unavailable.³⁵

The chronic deficits of medicines and low wages of personnel in the pharmacy network stimulated the emergence of a widespread second economy.³⁶ Medicines often were illegally acquired and sold through informal networks to hospital and polyclinic patients. Although efforts were made to eradicate such unethical and illegal practices, in October 1986 the Collegium of the Ministry of Health stated that "cases of embezzlement of and speculation in medicaments have not been eliminated."³⁷

Shortages of medicines also were a consequence of substandard planning, distribution, and storage by GAPU.³⁸ For example, a recent investigation revealed that in the pharmacies of Uzbekistan the value of expired, and therefore useless, stocks of imported medicines was over one million rubles.³⁹

D. THE MEDICAL INDUSTRY

The Soviet medical industry produces large quantities and varieties of medical commodities for sale in domestic and foreign markets in several hundred factories and farms that operate on a self-financing basis in over twenty different ministries.⁴⁰ The dominant organization during 1970-85 was the Ministry of Medical Industry USSR, which produced 80 percent of domestically-consumed medicines and 70 percent of medical equipment.⁴¹ Within the Ministry

³³ Tak pochemu 1976, Melnichenko 1976, Chelovek 1978, Industriya 1980, Kluyev 1985, Shmakov 1986, Uluchshat' 1986.

³⁴ Zagulskii 1985.

³⁵ Tak pochemu 1976.

³⁶ Davis 1987a.

³⁷ Utverzhdal 1986.

³⁸ Kluyev 1985.

³⁹ Surovyy 1987.

⁴⁰ Shevchenko 1974, Dergunov 1975, Davis 1984, Malov 1979.

⁴¹ Melnichenko 1976.

of Health USSR, the Main Administration for the Production of Bacterial and Viral Preparations and GAPU managed laboratories, small factories and state farms that produced vaccines, sera, allergens, and simple pharmacy products.⁴² The Main Administration of the Microbiological Industry of the Council of Ministers USSR was a third major organization. It controlled research institutes and industrial enterprises engaged in the genetic manipulation of micro-organisms and the production of pharmaceutical goods such as antibiotics, steroid hormones, insulin and interferon.⁴³

The production of pharmaceuticals and medical equipment by Soviet industry requires inputs of capital, labor and intermediate goods. In 1975 the Ministry of Medical Industry capital stock (*osnovnye fondy*) was divided between buildings and structures (57%), machinery and equipment (41%), and inventory (2%). Its facilities consisted of 106 industrial enterprises, five combines, two production associations, 15 experimental factories, 25 scientific-research, design and construction institutions, 23 state farms, 8 storage offices and 30 other facilities.⁴⁴ This capital stock grew significantly from 1975 to 1985.⁴⁵ There was also growth in the medical industry's labor force (about 3 percent per annum) and consumption of intermediate goods from other ministries and of imports.

The Ministry of Medical Industry USSR produced 6,546 different medical goods in 1975, that were distributed between major branches as shown in Table 3. The output of the Soviet medical industry rose substantially; the production index went up from 100 in 1970 to 382 by 1985. However, the aggregate growth rates fell over time: 88% in 1966-70; 73% in 1971-75; 58% in 1976-80; and 40% in 1981-85. In terms of branch output value, antibiotics was in first place and prepared medicines was in second.

During the 1970-85 period the medical industry was afflicted by numerous serious problems. Industrial enterprises often possessed buildings that were not specifically designed for pharmaceutical production and provided unhygienic and cramped working environments. Of the 26 factories which produced prepared medicines in 1975 only four were up to contemporary building standards.⁴⁶ Plans for new construction and capital repair of facilities were routinely underfulfilled by enterprises of the ministries of construction, industrial construction, and construction of heavy industry.⁴⁷ Furthermore, much of the machinery and equipment of the medical industry was old, technologically obsolete, operated in corrosive environments, and had little automated control. Chronic difficulties were encountered in obtaining replacements and spare parts for machinery and equipment, which resulted in above-norm repair, raw material and energy costs. In addition, there were reports of poor discipline among employees and uneven utilization of labor (idleness and storming) due to erratic supplies and bad management.⁴⁸

⁴² Gorenkov 1984, pg. 60.

⁴³ Baev 1982, Vorobyev 1986.

⁴⁴ Dergunov 1975, pg. 51.

⁴⁵ Razvitie 1981, Melnichenko 1984.

⁴⁶ Dergunov 1975, pg. 37.

⁴⁷ Industriya 1980, Melnichenko, 1984.

⁴⁸ Melnichenko 1984, Dergunov 1975, pg. 72.

TABLE 3.—THE OUTPUT OF THE SOVIET MEDICAL INDUSTRY

Product division	Number of products 1975	Shares of total output (percent 1975)	Value of output (millions of rubles)			Production index (1970 = 100)			
			1975	1980	1985	1970	1975	1980	1985
1. Synthetic medical substances.....	383	16.0	334	494	697	100	147	218	307
2. Antibiotics and organic preparations.....	326	19.2	401	726	1,118	100	174	315	485
3. Vitamins.....	137	20.0	418	669	923	100	247	395	545
4. Prepared medicines ¹	1,101	23.4	489	734	1,013	100	152	228	315
5. Medical equipment.....	4,164	15.6	326	504	645	100	148	229	293
6. Medical products of glass and plastic.....	435	5.8	121	175	227	100	159	231	300
Total.....	6,546	100.0	2,090	3,302	4,623	100	173	273	382

¹ Includes processed medicinal plants.

Sources: c.1, 2—Dergunov 1975, pg. 6, c.3—ibid., pg. 15 gives 1975 per capita medical industry output of 8.25 rubles. Multiply by 253.3 million people to get 2,090 million rubles. Apply c.2 shares to obtain row entries. c.4—multiply c.3 entries by growth indices 1976–80. c.5—multiply c.4 entries by growth indices 1981–85. c.6, 7—Prokopishin 1982, pg. 59, c.8—Melnichenko 1976 for growth indices 1976–80, c.9—Melnichenko 1984 for growth indices 1981–85.

Medical industry enterprises regularly experienced difficulties in obtaining contracted quantities of intermediate goods of adequate standards from all sources.⁴⁹ For example, a 1979 article stated that the Ministry of Agriculture had failed to fulfill its supply contracts for medicinal herbs ten years in a row and in 1978 had provided only one-third the promised amount.⁵⁰ These problems hampered the ability of the Ministry's enterprises to fulfill production plans and to maintain the quality of medicines and medical equipment produced.⁵¹

The technical sophistication of the products of the Soviet medical industry was influenced by the performance of the biomedical R&D institutions that were involved in fundamental research, applied research, development and innovation.⁵² The USSR's large scale biomedical R & D effort did produce some results of significance during 1970–85.⁵³ Despite this, numerous problems were evident such as the low technological levels of scientific facilities, poor quality of many commodities used in laboratory research and prototype production, low pay and poor promotion prospects of productive junior researchers, and rigid hierarchies in scientific institutions.⁵⁴ One recent article gave the following assessment of the situation:

Great claims are made by scientific-research and design institutes. But up to now they still do not satisfy the demands for new economic and effective technologies, they know poorly the problems of production, and the quality of their contributions lags behind international standards.⁵⁵

E. MEDICAL FOREIGN TRADE

The organization, planning and performance of the medical foreign trade sector of the USSR during 1970–85 have been examined

⁴⁹ Kalita 1986 reported that, even the state farms of the Ministry of Medical Industry chronically underfulfilled their production plans due to inadequate field machinery, plant processing equipment, and storage facilities.

⁵⁰ O lekarstvakh 1979.

⁵¹ Dergunov 1975, Industriya 1980, Utverzhdan 1986.

⁵² Davis 1984, 1985.

⁵³ Melnichenko 1976, Feshbach 1983, Sorokin 1984.

⁵⁴ Proizvodstvo 1986.

⁵⁵ Po puti 1986.

in detail elsewhere.⁵⁶ To summarize, trade was a state monopoly and planned by the Health and Medical Industry Department of Gosplan USSR in conjunction with the Ministry of Health, the Ministry of the Medical Industry, and the Ministry of Foreign Trade. The FTO with primary responsibility for implementing plans for the import and export of pharmaceuticals and medical equipment was Medexport. Trade in intermediate goods and machinery for the medical industry was carried out by FTOs Soyuzkhimexport, Tekhnomashimport and Tekhnopromimport. The State Committee for Science and Technology and the FTO Litsenzintorg played important roles in the licensing of technology for medical production.

The Soviet Union both imported and exported pharmaceutical goods, as shown in Table 4.⁵⁷ From 1970 to 1985 imports rose from 166.0 to 1,160.9 million rubles and exports increased from 31.8 to 104.8 million rubles. Imports grew at high rates from the mid-seventies, perhaps in response to rising concern by the leadership about the health situation, and their share of total imports went up from 1.1 percent in 1975 to 1.7 percent in 1985. Soviet exports of pharmaceuticals grew more slowly, their share of total exports declined, and the ratio of pharmaceutical exports to imports dropped from 22.6 to 9.0 percent.

TABLE 4.—TRENDS IN SOVIET FOREIGN TRADE IN PHARMACEUTICALS, 1975–85

Year:	Soviet trade in pharmaceuticals (million rubles)		Pharmaceutical shares of total Trade (percent)		Trade growth (percent increase on previous year)		Pharmaceutical exports as percent of pharmaceutical imports
	Imports	Exports	Imports	Exports	Imports	Exports	
1970.....	166.0	31.8	1.6	0.3	2	40	19.2
1975.....	289.7	65.5	1.1	0.3	26	2	22.6
1980.....	542.7	81.4	1.2	0.2	12	3	15.0
1981.....	756.1	83.7	1.4	0.1	39	3	11.1
1982.....	875.8	86.3	1.6	0.1	16	3	9.9
1983.....	971.1	95.7	1.6	0.1	11	11	9.9
1984.....	1,105.7	96.4	1.7	0.1	14	1	8.7
1985.....	1,160.9	104.8	1.7	0.1	5	9	9.0

Sources: The data on the values and shares of imports and exports of pharmaceuticals were obtained from Vneshnaya Torgovlya for years 1970, 1975, 1980–85. Trade growth was calculated by dividing Col. 1 and 2 entries by values of previous years. The figures for missing years were 1969—imports 163.0 and exports 22.5; 1974—imports 230.2 and exports 64.1; and 1979—imports 486.9 and exports 79.1. The shares shown in the final column were calculated by dividing Col. 2 by Col. 1 entries.

The USSR engaged in pharmaceutical trade with the three major regions of the world: Socialist (CMEA 6 plus Yugoslavia), OECD and Developing (including third world socialist). Table 5 shows that in 1985 the socialist countries were the source of 89.6 percent of goods, worth 1,040.5 million rubles. The developing countries provided 6.5 percent of Soviet imports. Imports from all OECD countries amounted to only 44.9 million rubles, or 3.9 percent of the total. The profile of exports was somewhat different: socialist countries 64.3 percent; developing countries 22.5 percent; and OECD countries 13.2 percent. The final column of Table 5 shows that the

⁵⁶ Davis 1984, pp. 77–106 and Davis 1985, pp. 28–93.

⁵⁷ A detailed empirical analysis of Soviet foreign trade in pharmaceuticals is presented in Davis 1985.

Soviet Union was a net importer of pharmaceuticals from all regions of the world.

Soviet foreign trade in pharmaceuticals by region and country are analyzed in detail elsewhere by this author.⁵⁸ From 1970 to 1985 pharmaceutical imports from socialist countries rose from 156,270 to 1,040,471 thousand rubles, but their share of total imports dropped from 94 to 90 percent. Hungary was the leading socialist country exporter to the USSR in the 1970s but Poland was in first place in 1980 and 1983-85.

Soviet direct imports from OECD countries (identified plus the unattributed residual which contained Finland, Italy and Denmark) increased in an uneven manner from 5,596 thousand rubles in 1970 to 44,871 thousand rubles in 1985. Finland was the most important Western exporter with 1985 sales of 29,582 thousand rubles. The next three were France (5,468 thousand rubles), Austria (2,213 thousand rubles), and Switzerland (2,038 thousand rubles). Soviet imports of medicaments from the U.S.A. declined markedly from a peak of 1,169 thousand rubles in 1976 to a low of 95 thousand rubles in 1984.

TABLE 5.—REGIONAL PATTERNS IN SOVIET PHARMACEUTICAL FOREIGN TRADE, 1985

Regions	Regional shares of pharmaceutical trade (percent)		Regional trade in pharmaceuticals (million rubles)		
	Imports	Exports	Imports	Exports	Net imports
All regions.....	100.0	100.0	1,160.9	104.8	1,056.1
Socialist countries.....	89.6	64.3	1,040.5	67.4	973.1
OECD countries ¹	3.9	13.2	44.9	13.8	31.1
Developing countries ²	6.5	22.5	75.6	23.6	52.0

¹ Identified OECD plus unattributed residual.

² Including Vietnam.

Sources: This table was constructed from data obtained in Vneshnaya 1985. The first step was to examine each country's entry for the statistics of exports and imports of commodities in category FTN 960-962. The sum was subtracted from the reported total to find the unattributed residual, which was 819 thousand rubles, in 1985. The country data were then aggregated by region. The residual was added to the OECD sub-total because exports of medicaments to the USSR by Italy and Denmark, documented in OECD statistics, were not reported as Soviet imports in Vneshnaya 1985. See Davis 1985, pp. 46-55 for an assessment of Soviet, OECD and EEC statistics on foreign trade in medicaments. The shares in Col. 1 and 2 were derived from the value figures in Col. 3 and 4. Col. 5 = Col. 3 - Col. 4.

The Soviet Union also conducted a substantial trade in pharmaceuticals with developing countries, especially India. Imports from this region rose from 4,920 thousand rubles in 1970 to 75,591 thousand rubles in 1985. Soviet imports from India in 1985 (59,458 thousand rubles) exceeded the total value of those not only from the OECD region but also from Yugoslavia.

F. FINAL HEALTH OUTPUT

The primary objective of the health production process shown in Diagram 1 is to improve the various indicators of final health output, such as recovery, invalidity and mortality rates. This can be accomplished either by reducing illness through programs designed to improve consumption or environmental health conditions or by upgrading the effectiveness of curative medical services.

⁵⁸ Davis 1985, pp. 55-92.

Throughout most of the period 1945-64, mortality and life expectancy indicators improved in the USSR, in conformance with international patterns.⁵⁹ During the next two decades, however, there was a striking reversal of previous mortality trends. The crude mortality rate in the USSR rose from 7.3 deaths per 1,000 in 1965 to a peak of 10.8 in 1984, or by 48 percent.⁶⁰ The infant mortality rate fell from 27.2 deaths per 1,000 live births to 22.9 between 1965 and 1971, but increased in following years.⁶¹ By 1976, its estimated value was 31.1 deaths/1,000 or 36 percent above the rate in 1971. The infant mortality rate apparently declined to 27.3 in 1980 and to 25.3 in 1983, but then went up in each of the next two years to 26.0 deaths per 1,000 live births in 1985.⁶² These increases were most unusual by the standards of other industrialized countries.⁶³

Most Soviet age-specific death rates exhibited similar upward trends in the 1970s. Table 6 shows that the rate for the 0-4 age group went up from 6.7 deaths per 1,000 in 1970/71 to 8.1 in 1980/81. In the next three quintiles, covering ages 5-19, minimum post-war rates were maintained up to 1980/81. But all older age groups exhibited increases from the minimum. For example the rates (deaths per 1,000) rose from 6.0 to 8.0 in age group 45-49 years and 18.0 to 20.6 in age group 60-64.

During the 1980s the trends in age-specific death rates became more varied. Of the fifteen age groups for which official statistics are available, nine had declining rates from 1980/81 to 1984/85, one remained stable, and five rose. Those that exhibited increases were the groups 40-44, 50-54, 55-59, 65-69 and over 70 years. The final column of Table 6 shows that in 1984/85 the death rates for age groups 0-4 and all above 30 years were higher than previously attained minimum rates.

Life expectancy estimates for the USSR reflect the country's mortality experience. From 1958/59 to 1971/72 Soviet life expectancy at birth increased from 69 to 70 years. But rising mortality rates then drove it down to 68 years in 1984/85. In that year life expectancy was 64 years for males and 73 years for females.⁶⁴

This unusual Soviet mortality experience during 1970-85 indicated serious difficulties within the health production process. Although the political leadership in the USSR became concerned about the health situation by the late 1970s and took action to improve it, the continuing mortality increases in the eighties showed that health problems had not been solved by the time Mikhail Gorbachev assumed power.

⁵⁹ Davis 1977, 1979; Dutton 1979; Feshbach 1982.

⁶⁰ Narodnoe 1922-1982, pg. 28; 1985, pg. 33. Since the US rate declined from 9.4 deaths per 1,000 in 1965 to 8.6 in 1983 (Statistical 1985, pg. 57) the Soviet experience did not represent a universal tendency caused by the aging of the population.

⁶¹ Davis and Feshbach 1980, Field 1986. Research by Jones and Grupp 1983 and others suggests that part of the rise in published infant mortality rates may have been due to improved statistical reporting.

⁶² Naselenie 1986 and Statisticheskoe 1986.

⁶³ Davis 1986a. For example, in the U.S., the infant mortality rate decreased uninterruptedly from 20.0 deaths per 1,000 live births in 1970 to 10.6 in 1984 (Statistical 1985, pg. 73).

⁶⁴ Statisticheskoe 1986. In Sluzhba 1987 Dr. Fedorov provides the male-female figures and observes critically that the USSR is ranked 35th in the world in terms of life expectancy.

TABLE 6.—AGE-SPECIFIC DEATH RATES IN THE USSR, 1970/71–1984/85

[Deaths per 1,000 in the age group]

Age group	Years								1984/85 as percent of minimum since 1964/65
	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1980/81	1984/85	
All ages ¹	8.2	8.4	8.6	8.7	9.0	9.4	10.3	10.7	152
0 to 1 ²	22.9	24.7	26.4	27.9	29.4	31.1	26.9	26.0	114
0 to 4	6.7	6.8	7.2	7.7	8.2	8.7	8.1	7.7	115
5 to 9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	86
10 to 14	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	100
15 to 19	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	90
20 to 24	1.6	1.6	1.6	1.5	1.7	1.7	1.8	1.5	100
25 to 29	2.2	2.1	2.1	2.0	2.1	2.1	2.3	2.0	100
30 to 34	2.8	2.8	2.8	2.8	3.0	3.0	3.0	2.8	112
35 to 39	3.8	3.7	3.6	3.6	3.7	3.8	4.4	3.6	116
40 to 44	4.7	4.8	4.8	4.9	5.2	5.3	5.6	5.7	150
45 to 49	6.0	6.1	6.2	6.4	6.7	6.9	8.0	7.3	146
50 to 54	8.7	8.8	8.6	8.8	9.0	9.3	10.8	11.3	145
55 to 59	11.8	11.9	12.5	12.3	13.0	13.4	13.9	15.1	140
60 to 64	17.9	18.1	18.0	18.2	18.3	18.9	20.6	20.4	119
65 to 69	26.9	26.8	27.2	27.0	27.4	28.0	29.5	31.1	127
Over 70	74.9	74.8	75.5	73.5	73.3	75.0	77.2	78.7	123

¹ The crude death rate.² The infant mortality rate—measures deaths during first year of life per 1,000 live births. Rates are for the latest year shown in column headings (e.g. the 1971 rate is in the 1970/71 column).

Sources: Years 1970/71–1975/76—Davis and Feshbach 1980, pg. 2. Years 1980/81, 1984/85—Statisticheskii 1986, pg. 71. The percentages in the final column were calculated by finding the minimum rate during 1964/65–1975/76 for each age group in Davis and Feshbach 1980, pg. 2, dividing the 1984/85 values by it, and multiplying by 100.

IV. HEALTH SECTOR POLICY AND PLANS UNDER GORBACHEV: 1986–90

The Gorbachev regime clearly has recognized the deficiencies in the health sector and the importance of correcting them. At the 27th Party Congress leading Politburo members such as Mikhail Gorbachev, Nikolai Ryzhkov, and Andrei Gromyko mentioned health issues on several occasions in their speeches, and the revised Party Program referred to health promotion as a “matter of paramount importance”.^{65 66} In order to improve the situation the Soviet government has developed a revised health strategy and remedial policies. This section reviews selected aspects of the health sector reform program and plans.

A. PERESTROIKA IN THE HEALTH SECTOR

In developing its health strategy the Gorbachev regime appears to have recognized the complexity of the health production process and the need to carry out a *perestroika* (restructuring) of the health sector. This was evident in Gorbachev’s speech at the 27th Party Congress, which stated that:

For every person, and indeed society, there is nothing more valuable than health. The maintenance and strengthening of the people’s health is a matter of utmost importance. We must view problems of health from broad social standpoints. It is primarily defined by conditions of work and life and the level of well-being, and of course public health care has enormous significance. We must satisfy as soon as possible the population’s requirements for high-quality curative, preventive and medi-

⁶⁵ XXVII 1968: vol. I pp. 71 and 193, vol. II, p. 45.⁶⁶ Programma 1985.

nal help everywhere. And all this poses in a new way the matter of the material and technical base of the health service and how to tackle many urgent scientific, organizational and cadre problems. Considerable funds will, of course, be required, and we shall have to find them.⁶⁷

In sum, the new health strategy appears to be one of raising the effectiveness of public health programs and shifting the medical system onto an intensive development path.

The policies that have been announced or implemented by the Gorbachev regime appear to have been influenced by this health strategy as well as by general reformist ideas and programs.⁶⁸ Many measures have been devoted to improving public health and preventive medicine. The national anti-alcohol campaign has an important health component, because a reduction in alcohol consumption should reduce the incidence of accidents, some degenerative diseases and birth defects. An energetic effort is being made to progress toward comprehensive screening of the entire population for diseases. Greater attention also is being given to the improvement of the low level of public sanitation and the reduction in environmental pollution. With respect to curative medicine, policies have been introduced to upgrade the quality of medical care, to promote efficiency, and to improve the performance of supporting health sector institutions. These include: wide-scale replacement of ineffectual health sector leaders; substantial pay increases for medical staff and increased differentiation of wages; expansion of the network of fee-for-service polyclinics; crackdown on second economy activity; intensification of pressure on construction organizations to fulfil contracts for the building and repair of medical facilities; improvement of the distribution of medicaments and medical equipment; acceleration of technical progress in medical industry and biomedical R&D establishments; and reform of medical foreign trade structure and mechanisms.

B. CHANGES IN PERSONNEL AND LABOR POLICY

During the two years since Gorbachev came to power there have been substantial changes among top administrators in the health sector. In November 1985 the Minister of the Medical Industry USSR, A.K. Melnichenko, was replaced by V.A. Bykov and several Deputy Ministers were removed when the ministry was re-organized.⁶⁹ Several months later the Ministry of Health's long-serving Head of the Main Administration for the Introduction of New Drugs and Medical Equipment, E. Babayan, was fired for deficient work on the anti-alcohol program. Two Deputy Ministers of Health, P. Burgasov and A. Safonov, were retired in disgrace in late Autumn 1986 following criticism of them in *Pravda*.⁷⁰ In January 1987 the Ministry of Health USSR lost its Minister, S.P. Burenkov, and the Head of the Planning-Finance Administration, V.V. Golovtsev, for their failure to introduce in a timely manner the pay rise for medical staff announced in September 1986.⁷¹ The next month

⁶⁷ XXVII 1986, p. 71.

⁶⁸ For an example of the impact of *glasnost* see the self-criticism of *Meditinskaya Gazeta* in *Deistvennost* 1986.

⁶⁹ V Prezidium 1985, Valerii 1985, *Sobranie* 1986.

⁷⁰ The original criticism appeared in Chernyak 1986. The announcement of the dismissals was in Potekhin 1986.

⁷¹ V. Sovete 1987, V Ministerstve 1987.

the Chief of GAPU, M.A. Kluyev, was retired in disgrace for the continuing poor work of the pharmacy system.⁷²

The General Director of Medexport, Mr. Bunatin, lost his job when the FTO was merged with the Ministry of the Medical and Microbiological Industry USSR. Furthermore, there have been strict reprimands, reprimands, and criticisms administered to most republican Ministers of Health, several Deputy Ministers of Health USSR, the Deputy President of the Academy of Medical Sciences, the Head and leading staff of Soyuzmedtekhnik, and many Heads of Main Administrations in the Ministry of Health.⁷³ In sum, by February 1987 most of the leaders of the health sector economic institutions examined in section III. had been fired or reprimanded for poor performance by the Gorbachev regime.

There have been substantial changes in policies affecting the work conditions and wages of lower level personnel in the health sector. In recognition of the lack of material incentives for medical staff the government has introduced a wage reform that over the next several years will increase substantially average medical wage levels and differentiate wages in accordance with performance and the difficulties of jobs.⁷⁴ Sticks have been used as well as carrots, however, to improve management and labor productivity. In the two years since Gorbachev came to power 165 heads of medical establishments have been fired for substandard work and criticism has been directed against many others by the media and party organizations. A tough anti-corruption campaign has been launched against the medical and pharmacy staff who engage in second economy activities. In the biomedical R&D system the process of *attestatsiya* (attestation) is being used to weed out incompetent and unproductive scientific and technical staff. Efforts have been made throughout the health sector to tighten labor discipline of workers and employees, with the objectives of raising on-the-job productivity and reducing absenteeism caused by late arrival at work, unauthorized personal errands, and falsified illness certificates. Finally, there have been initial discussions of Gorbachev's speech at the January 1987 Central Committee Plenum 'About the reconstruction and cadre policy of the party.'⁷⁵ This may have resulted in modest steps to introduce more 'self-management,' 'democracy in production' and 'open selection' in the health sector.

C. CHANGES IN ORGANIZATION AND THE ECONOMIC MECHANISM

The Gorbachev regime believes that many of the deficiencies in the economy during the 1970s were caused by ministries' conservatism, departmentalism and bureaucratic meddling in the affairs of subordinate units. As a result, steps have been taken to increase the powers of the central authorities, rationalize the organization of ministries, and give subordinate enterprises more power. A number of changes of this type have been introduced in the health sector.

⁷² Surovyy 1987.

⁷³ Chernyak 1986, Refleks 1986, Utverzhdai 1986, V Sovete 1987, V Ministerstve 1987, Sorovyy 1987.

⁷⁴ V Politburo 1986a, Meditsinskie 1986.

⁷⁵ Gorbachev 1987, Utverzhdai 1987, Vremya 1987.

The government has tried to eliminate ministerial duplication of effort and improve co-ordination by creating various 'super ministries' that have overall responsibility for key sectors of the economy. One of these is the Bureau for Social Development, which was established in October 1986 and will have responsibility for ensuring the fulfillment of the 'social program' outlined at the 27th Party Congress.⁷⁶ It is likely that this Bureau will have responsibility for managing the inter-departmental 'Complex Program of Measures for the Intensification of Prevention of Illness and Strengthening the Health of the Population of the USSR during 1985-1990.'⁷⁷

Under Gorbachev a number of ministries have been abolished or merged. This has happened in the health sector. On 22 November 1985 a new Ministry of the Medical and Microbiological Industry USSR was created by amalgamating the Ministry of Medical Industry USSR and the Main Administration of the Microbiological Industry.⁷⁸ Although the reasons for this re-organization were not given, they probably were dissatisfaction with the work of the old Ministry of the Medical Industry (see section III.D) and a heightened interest in microbiologically-based medicines. This merger undoubtedly upgraded the average technological level of the medical industry.

In January 1987 all of the industrial enterprises of the Ministry of the Medical and Microbiological Industry changed their operating procedures to those developed in the Andropov experiment and approved in the July 1985 party/state decree.⁷⁹ This entails a moderate decentralization of decision making power from ministry to enterprises, which now have more rights to decide on the commodity composition, quantity and prices of output and to retain of profits for self-determined investments and bonuses. New pricing and bonus formulae reward firms that produce high-quality, innovative products and penalise those producing inferior, obsolete goods.

The Gorbachev regime has issued several decrees that are intended to alter radically the foreign trade system.⁸⁰ Twenty ministries (including the Ministry of the Medical and Microbiological Industry) and 70 enterprises have been awarded expanded rights from January 1987 to conduct export-import operations with foreign partners and authorization has been given for Soviet firms to enter into new forms of economic relations with Western companies, such as joint ventures. The Ministry of the Medical and Microbiological Industry has acquired the administrative expertise necessary to conduct these foreign transaction by absorbing the FTO Medexport in January 1987. Since the primary objective of the reform is to promote exports, the Ministry is being allowed to keep a substantial portion of the hard-currency its enterprises earn as an incentive. It can use these funds to finance imports of technology and intermediate products needed in pharmaceutical manufacturing. The Ministry also has enhanced rights to engage in sci-

⁷⁶ Politburo 1986b.

⁷⁷ See Burenkov 1986, Kursom 1986, for a discussion of the Complex Program.

⁷⁸ V Prezidiume 1985.

⁷⁹ Utverzhdan 1987, Vstrechi 1987.

⁸⁰ O merakh 1986.

entific-technological co-operation and to establish joint ventures in medical commodity production with Western companies.

Under Gorbachev the Soviet government is trying to encourage an expansion of production of non-food goods and services for consumers. This is to be accomplished within the framework of the Complex Program for the Development of Consumer Goods and Services in the Period 1986-2000.⁸¹ One health-related objective is to expand the number of fee-for-service outpatient clinics and raise the quality of their facilities and services. Although these establishments have existed for many years, they have been consciously limited in number and starved of resources. A February 1986 article criticized the inadequate number, dilapidated capital stock, and poor working conditions of fee-for-service clinics and called for remedial action.⁸²

D. THE 12TH FIVE YEAR PLAN FOR THE HEALTH SECTOR

The general economic strategy underlying the medium-term 12th Five Year Plan is to accelerate economic growth and technological progress through a program of personnel changes, tightening of labour discipline, limited reorganization and reform of the economy, and adjustment of end-use and sectoral priorities. During 1986-90 all branches of the economy, including health, are supposed to attain ambitious output targets while simultaneously raising efficiency in production and the quality of products.

The Soviet government does not prepare a consolidated health plan that covers all the activities shown in Diagram 1, nor does it publish much information about the plans of the individual health sector institutions. Given these difficulties, a straight-forward assessment of the 12th Five Year Plan for Health is not possible. Instead, this section outlines available plan targets and evaluates likely developments during 1986-90 for each of the health sector institutions.⁸³

Various changes in the illness pattern can be anticipated during 1986-90. Improvements in the standard of living and public sanitation should reduce the prevalence of infectious disease. If alcohol consumption remains stable or diminishes as a result of the anti-alcohol campaign, then the accident rate may decline, although poisonings from alcohol substitutes may go up. One can expect a further increase in the incidence of cardiovascular illness due to factors such as population ageing, rising share of males, high-cholesterol diet, after-effects of excessive consumption of alcohol, smoking, and urban stress. Lung cancer should become more prevalent due to the rising consumption of cigarettes.

The combination of population growth (from 276 to about 289 million) and increased incidence of degenerative disease should drive up the amount of illness in the USSR. Since the educational level will rise and no significant price barriers to medical care will be introduced, the demand for medical services should continue to grow rapidly.

⁸¹ Kompleksnaya 1985.

⁸² Poltinnik 1986.

⁸³ This section is based upon material from Osnovnye 1985, Shmakov 1986, Proizvodstvo 1986, Po puti 1986, Prodiotvano 1986, and Burenkov 1986.

The 12th Plan calls for an increase in both polyclinic and hospital activities.⁸⁴ Outpatient services are to expand by 908,000 visits per shift, which will increase the total number of outpatient consultations per year from 3,168 million in 1985 to 3,731 in 1990. Admissions to hospitals and the provision of hospital bed-days will grow by 4-5 percent per annum. More stress will be placed on preventive medicine than in the past and the share of the population subject to periodic screening will be increased substantially. There is also to be an 80 percent increment in the provision to the population of diagnostic, curative medical, dental and ophthalmic services on a fee-paying basis by self-financing outpatient clinics.

Despite attempts to increase efficiency, the expansion of services during 1986-90 will require additional supplies of labor and commodities. The number of doctors probably will grow by about 2 percent per annum, so by 1990 their number should reach 1,291,700. Investment in the medical system is to grow by 60 percent and the hospital bed stock is supposed to expand from 3,608 thousand beds in 1985 to 3,966 thousand in 1990. Purchases by the medical system of pharmaceuticals should rise by about 8 percent a year, from 1,481 million rubles in 1985 to 2,176 million rubles in 1990.

The 12th Plan did not reveal any information about projected health finance during 1986-90. If the leadership upgrades the priority of the medical system and finds the funds that Gorbachev claimed were needed, then state budget expenditure on health could grow by 6 percent per annum, to 23.4 billion rubles in 1990. Financial contributions from non-budgetary sources (enterprises, farms) should rise more rapidly over the next five years. So the health share of N.M.P. utilized should go up.

The pharmacy system will expand during the 12th Plan period and its turnover is projected to grow at about 9 percent per annum, from 4,385 million rubles in 1985 to 6,747 million rubles in 1990.⁸⁵ It can be anticipated that retail sales in pharmacies will rise more rapidly than wholesale, since the government will want to soak up more of the purchasing power of the population.

The reorganization of the Ministry of Medical and Microbiological Industry and the addition of the technologically advanced microbiology industry enterprises should exert a positive influence on the quality and sophistication of pharmaceutical products. Medical industry output should increase at the planned annual rate of about 7 percent, from 4,623 million rubles in 1985 to 6,484 million rubles in 1990. The Ministry is scheduled to introduce 140 new products and to double its investment in re-construction and re-equipment from 1981-85 levels.⁸⁶ The medical industry should be assisted by changes in the R & D sector, which should accelerate the current slow rate of technological progress in the biomedical area.

The Ministry of Medical and Microbiological Industry USSR has set itself the task of satisfying 'fully, one-hundred-percent the requirements of the health service and population for medicaments by 1995'.⁸⁷ However, this objective seems unrealistic in the

⁸⁴ Burenkov 1986, *Prodiuktovano* 1986.

⁸⁵ Shmakov 1986.

⁸⁶ *Po puti* 1986.

⁸⁷ *Utverzhdai* 1987.

medium-term given the anticipated substantial increase in domestic demand for medicines and the planned 7 percent per annum growth in Soviet medical industry output. During 1986-90 there should be a further increase in pharmaceutical imports by the USSR. If one assumes that annual growth is held to the low 1985 rate of 5 percent, then the total value of imports of medicaments would increase from 1,161 million rubles in 1985 to 1,482 million rubles in 1990. The socialist countries share of this trade should rise, whereas the shares of the developed West and developing countries should decline.

The Gorbachev regime is making an energetic effort to correct existing problems in the health production process in the USSR. New measures have been introduced to encourage health-maximizing behavior by the population, improve preventive medicine, upgrade the quality and effectiveness of curative medical care, and raise the performance standards of other health sector institutions. It can be anticipated that not all programs will be successful nor will all plans be fulfilled. Throughout the 12th Plan period relatively tight constraints will be maintained on health sector resources.

Despite various contradictions, the current health strategy of the Soviet Union seems sensible and the net effect of the various policies on final health output appears to have been positive. The crude death rate fell from 10.8 deaths per 1,000 in 1984 to 10.6 in 1985 and 9.7 in 1986.⁸⁸ Recent reports indicate that some age-specific mortality rates declined and national life expectancy rose to 69 years. During 1987-90 there is a reasonable chance that these trends will continue. To be more specific, mortality rates of infants and young adults may fall, although age-specific death rates of the elderly should continue to increase. These mortality rate declines would result in a further rise in life expectancy in the USSR. Such developments would be beneficial for the Soviet population and would reflect favorably on the welfare commitment and health sector policy of the Gorbachev government.

V. REFERENCES

- Baev, A.A. and Kuznetsov, O.M. 1982 *Konstruktor Zhivogo*, Moscow, Sovetskaya Rossiya.
- Batyunina, E.V. and Borisenko, L.V. 1985 'Kadry nefarmatsevticheskikh spetsialistov v apteknykh uchrezhdeniyakh', *Farmatsiya*, No. 2.
- Burenkov, S.P. 1986 'Zadachi Sovetskogo zdravookhraneniya i meditsinskoi nauki v svete reshennii XXVII S'ezda KPSS', *Sovetskoe Zdravookhranenie*, No. 7.
- 'Chelovek obratilsya v apteku', 1978 *Pravda*, 21 May 1978.
- Chernyak, A. 1986 'Zdorovye dorozhe bogatstva', *Pravda*, 15 October 1986.
- 'Chto mozhet vitamin', 1985, *Izvestiya*, 13 December 1985.
- Cooper, R. 1981 'Rising death rates in the Soviet Union: the impact of coronary heart disease', *New England Journal of Medicine*, 304:1259-1265.
- Cooper, R., and Schatzkin, A., 1982 'Recent trends in coronary risk factors in the USSR', *American Journal of Public Health*, 72: 431-40.
- Davis, C. 1977 'An Analysis of Mortality and Life Expectancy Trends in the USSR: 1959-1975', Cambridge (England), Discussion Paper.
- Davis, C. 1979 'The Economics of the Soviet Health System: An Analytical and Historical Study, 1921-1978', Cambridge, Dissertation for Ph.D. Degree in Economics from Cambridge University.

⁸⁸ Soobschenie 1987.

- Davis, C. 1981 'The health care system' in J. Berliner, B. Schwalberg and C. Davis *The Economics of Soviet Social Institutions*, Washington D.C., Final Report to the National Council for Soviet and East European Research.
- Davis, C. 1983 'The Economics of the Soviet Health System' in U.S. Congress, Joint Economic Committee *Soviet Economy in the 1980s: Problems and Prospects*, Washington D.C., U.S.G.P.O.
- Davis, C. 1984 *The Health and Pharmaceutical Sectors in the Soviet Economy*, Washington D.C., Wharton Econometric Forecasting Associates, Special Report.
- Davis, C. 1985 *Opportunities in the Soviet Pharmaceutical Market in the 1980s*, London, Scrip Country Report.
- Davis, C. 1986a 'Reviewing Soviet health care problems', *The Wall Street Journal* (European Edition), 31 October 1986.
- Davis, C. 1986b 'The organization and performance of the contemporary Soviet health service' in G. Lapidus and G. Swanson (eds.) *State and Welfare, USA/USSR*, Berkeley, forthcoming.
- Davis, C. 1987a 'The Soviet health system: A national health service in a socialist society' in M. Field (ed.) *Issues and Problems in Cross-National Studies of Health Systems*, London, Tavistock Press, forthcoming.
- Davis, C. 1987b 'Priority and the Shortage Model: The Medical System in the Socialist Economy,' in C. Davis and W. Charemza (eds.) *Models of Disequilibrium and Shortage in Centrally Planned Economies*, London, Chapman and Hall, forthcoming.
- Davis, C. and Feshbach, M. 1980 *Rising Infant Mortality in the USSR in the 1970's*, Washington D.C., Bureau of the Census Report, Series P-95 No. 74.
- 'Deistvennost gazetnoi stroke' 1986, *Meditinskaya Gazeta*, 28 March 1986.
- Dergunov, T. Ya. and Zazhilov, N.I. 1975 *Puti Povysheniya Effektivnosti Proizvodstva Otrastei Meditsinskoi Promyshlennosti*, Moscow, Meditsina.
- Dutton, J. 1979 'Changes in Soviet Mortality Patterns, 1959-77', *Population and Development Review*, 5: 267-291.
- Feshbach, M. 1982 'The Soviet Union: Population Trends and Dilemmas', Washington D.C., *Population Bulletin*, vol. 37, No. 3.
- Feshbach, M. 1983 'Issues in Health Problems' in U.S. Congress, Joint Economic Committee *Soviet Economy in the 1980s: Problems and Prospects*, Washington D.C., U.S.G.P.O.
- Feshbach, M. 1986 'Recent research on Soviet health conditions', Cambridge, Paper presented at the NASEES Annual Conference, March 1986.
- Field, M. 1967 *Soviet Socialized Medicine: An Introduction*, New York, The Free Press.
- Field, M. 1986 'Soviet infant mortality: A mystery story' in D.B. Jelliffe and E.F.P. Jelliffe *Advances in International Maternal and Child Health*, Oxford, Clarendon Press.
- Gorbachev, M.S. 1987 'O perestroike i kadrovoy politike partii', Speech delivered at the 27 January 1987 CPSU Central Committee Plenum, *Sovetskaya Rossiya*, 28 January 1987.
- Gorenkov, V.F. 1982 *Ekonomika Farmatsiya*, Minsk, Vysheishaya Shkola.
- Gorenkov, V.F. 1984 *Organizatsiya i Ekonomika Sovetskoi Farmatsiya*, Minsk, Vysheishaya Shkola.
- Heinemeier, M. 1977 *Consumption by Industrial Sector*, Washington D.C., CIR Staff Paper No. 13, January 1986.
- 'Industriya zdorovye' 1980, *Pravda*, 9 February 1980.
- Jones, E. and Grupp, F.W. 1983 'Infant mortality trends in the Soviet Union', *Population and Development Review*, 9: 213-246.
- Kalita, V. 1986 'Defitsit nachinaetsya v pole', *Meditinskaya Gazeta*, 3 September 1986.
- Kaser, M. 1976 *Health Care in the Soviet Union and Eastern Europe*, London, Croom Helm.
- Kluyev, M.A. 1985 'Zadachi aptechnoi sluzhby po dalneishemu uluchsheniyu lekarstvennogo obespecheniya naseleniya i lechebno-profilakteskikh uchrezhdenii v svete reshenii Aprelskogo (1985 g.) Plenuma TsK KPSS', *Farmatsiya*, No. 6.
- Knaus, W. 1982 *Inside Russian Medicine*, New York, Everest House.
- 'Kompleksnaya Programma Razvitiya Proizvodstva Tovarov Narodnogo Potrebleniya i Sfery Uslug na 1986-2000 Gody' 1985, *Ekonomicheskaya Gazeta*, No. 41.
- Korchagin, V.P. 1980 'Problemy Ekonomiki Zdravookhraneniya v Usloviyakh Razvitiya Sotsializma', Moscow, Dissertation for Doctoral Degree in Economics.
- Krikov, V.I. 1976 *Organizatsiya i Ekonomika Farmatsiya*, Moscow, Meditsina.
- 'Kursom intensivatsiya' 1986, *Meditinskaya Gazeta*,

- Malov, N.I. 1979 'Obespechenie uchrezhdenii zdravookhraneniya i naseleniya izdeliyami meditsinskogo naznacheniya', *Planovoe Khozyaistvo*, No. 3.
- 'Meditsinskie kadry i zarplata' 1986, *Izvestiya* 22 October 1986.
- Melnichenko, A.K. 1976 'Pyatiletka meditsinskoi promyshlennosti' *Izvestiya* 1 August 1976.
- Melnichenko, A.K. 1984 'Odinatsataya pyatiletka: god chetvertyy', *Khimiko-Farmatsevticheskii Zhurnal*, No. 6.
- Narodnoe Khozyaistvo SSSR v 1965 g . . . v 1985 g*, Moscow, Finansy i Statistika.
- 'Naselenie SSSR' 1986, *Ekonomicheskaya Gazeta*, No. 43.
- 'O lekarstvakh' 1979, *Izvestiya*, 23 June 1979.
- 'O merakh po korennomu sovershenstvovaniyu vneshneekonomicheskoi deyatelnosti' 1986, *Pravda*, 24 September 1986.
- 'Osnovnye Napravleniya Ekonomicheskogo i Sotsialnogo Razvitiya SSSR na 1986-1990 Gody i na Period do 2000 goda' 1985, *Pravda*, 9 November 1985.
- 'Po puti uskoreniya' 1986, *Meditsinskaya Gazeta*, 23 July 1986.
- 'Poltinnik pretknoveniya' 1986, *Meditsinskaya Gazeta*, 14 February 1986.
- Potekhin, E. 1986 'Zdorove dorozhe bogatstva' *Pravda*, 5 December 1986.
- 'Prodiatovano vremenem' 1986, *Meditsinskaya Gazeta*, 23 July 1986.
- 'Proizvodstvo lekarstv vozrastet' 1986, *Meditsinskaya Gazeta*, 7 February, 1986.
- Prokopishin, V.I. 1982 *Lekarstvennaya Pomoshch' v Sisteme Sovetskogo Zdravookhraneniya*, Kishinev, Shtiintsa.
- 'Programma Kommunisticheskoi Partii Sovetskogo Soyuza (Novaya Redaktsiya)', 1985, *Pravda*, 16 October 1985.
- 'Razvitie meditsinskoi promyshlennosti' 1981, *Ekonomicheskaya Gazeta*, No. 22.
- 'Refleks inertnosti, ili chto meshaet perestroike' 1986, *Meditsinskaya Gazeta*, 24 September 1986.
- 'Rezervy nauki' 1985, *Meditsinskaya Gazeta*, 25 December 1985.
- Ryan, M. 1978a *The Organization of Soviet Medical Care*, London, Martin Robertson.
- Ryan, M. 1978b 'The organization of the Soviet pharmaceutical service', Swansea, Report on a Study Tour.
- Shevchenko, A.P. 1974 *Voprosy Ekonomiki Khimiko-Farmatsevticheskoi Promyshlennosti*, Moscow, Meditsina.
- Shmakov, N.M. 1986 'Osnovnye zadachi dal'neishego razvitiya lekarstvennogo obespecheniya naseleniya v usloviyakh nauchno-tekhnicheskogo progressa, *Farmatsiya*, No. 1.
- 'Sluzhba zdorov'ya trebuetsya rekonstruktsii' 1987, *Meditsinskaya Gazeta*, 27 February 1987.
- Sobranie Postanovlenii Pravitelstva Soyuza Sovetskikh Sotsialisticheskikh Respublik*, 1986, No. 9.
- 'Soobschenie TsSU SSSR: Pyatiletke—kachestvo i Tempi' 1987, *Ekonomicheskaya Gazeta*, No. 5.
- Sorokin, A.G. 1984 'Uskorit nauchno-tekhnicheskii progress v khimiko-farmatsevticheskoi promyshlennosti' *Khimiko-Farmatsevticheskii Zhurnal*, No. 6.
- Sorokin, A.G. 1985 'Diya okhrany zdorovya Sovetskikh lyudei' *Khimiko-Farmatsevticheskii Zhurnal*, No. 6.
- Statistical Abstract of the United States* 1985, Washington, D.C., U.S. Bureau of the Census.
- 'Statisticheskie materialy' 1986, *Vestnik Statistiki*, No. 12, p. 71.
- 'Surovyy urok' 1987, *Meditsinskaya Gazeta*, 4 February 1987.
- 'Tak pochemu rastet "defektura"?' 1976, *Literaturnaya Gazeta*, 5 May 1976.
- Tarasova, L.G. and Lemenev, L.M. 1967 *Rukovodstvo po Planirovaniyu Khozyaistvenno-Finansovoi Deyatelnosti Apteki*, Moscow, Meditsina.
- Tarasova, L.G. and Semenova, T.D. 1977 *Organizatsiya i Ekonomika Farmatsii*, Moscow, Meditsina.
- Tarasova, L.G., Lemenev, L.M. and Savel'eva, Z.A. 1981 *Uchebnoe Posobie Po Ekonomike i Planirovaniyu Khozyaistvenno-Finansovoi Deyatelnosti Aptek*, Moscow, Meditsina.
- Treml, V. 1982a 'Death from alcohol poisoning in the USSR', *Soviet Studies*, No. 4.
- Treml, V. 1982b *Alcohol in the USSR: A Statistical Study*, Durham, N.C., Duke University Press.
- 'Trudnye shagi perestroika' 1987, *Meditsinskaya Gazeta*, 23 January 1987.
- 'Uluchshat' lekarstvennoe obespechenie' 1986, *Meditsinskaya Gazeta*, 14 March 1986.
- 'Utverzhdat delom' 1986, *Meditsinskaya Gazeta*, 15 October 1986.
- 'Utverzhdat delom' 1987, *Meditsinskaya Gazeta*, 13 February 1987.
- 'Utverzhdat initsiativu i delovitost' 1986, *Meditsinskaya Gazeta*, 30 April 1986.

- 'V Ministerstve Zdravookhraneniya SSSR' 1987, *Meditinskaya Gazeta*, 7 January 1987.
- 'V Politburo TsK KPSS' 1986a, *Meditinskaya Gazeta*, 17 September 1986.
- 'V Politburo TsK KPSS' 1986a, *Meditinskaya Gazeta*, 17 October 1986.
- 'V Prezidiume Verkhovnogo Soveta SSSR' 1985, *Pravda*, 22 November 1985.
- 'V Sovete Ministrov SSSR' 1987, *Meditinskaya Gazeta*, 7 January 1987.
- 'Valerii Alekseyevich Bykov' 1985, *Izvestiya* 2 December 1985.
- Vneshnyaya Torgovlya SSSR v 1970 . . . 1985*, Moscow, Finansy i Statistika.
- 'Vokrug tabletki' 1986, *Meditinskaya Gazeta*, 12 September 1986.
- 'Vremya konkretnykh del' 1987, *Meditinskaya Gazeta*, 25 February 1987.
- 'Vstrechi s delegatami' 1987, *Meditinskaya Gazeta*, 20 February 1987.
- Vorobyev, A. and Petrova, L. 1986 'S pomoshchyu biotekhnologii', *Meditinskaya Gazeta*, 18 April 1986.
- XXVII S'ezd Kommunisticheskoi Partii Sovetskogo Soyuza: Stenograficheskii Otchet (3 Volumes)*, 1986, Moscow, Politizdat.
- Zagalskii, L. 1986 'Tabletki dlya Zolushki', *Meditinskaya Gazeta*, 29 November 1985.
- Zagalskii, L. 1986 'Tabletki pod podushkoi', *Meditinskaya Gazeta*, 16 April 1986.

COMMENTARY*

By David Granick**

There is no disagreement among analysts that the Soviet economy enjoys a low degree of frictional employment¹ and a high degree of job security² in existing jobs. The issue in dispute is the cause of these facts, and thus their implications for possible future change in the Soviet economy.

One explanation is that the Soviet economy is permanently overheated; the Soviet worker has the same degree of employment security, and essentially for the same reason, as does the worker in a liberal capitalist economy in periods of high boom.³ An alternative explanation is that of Elizabeth Teague in this volume: that employment and job security are part of the implicit social contract which exists between Soviet leaders and the Soviet population. This latter explanation—i.e., that these are constraints upon decision making by Soviet leaders—is indistinguishable in its consequences from a third alternative that considers such overfull employment and job rights as constituting lexicographic preferences of these leaders.⁴ It is in this combined form of social contract and/or lexicographic preferences that I wish to treat the alternative to the overheating explanation of full employment and job rights.

The difference between the two explanations is of considerable importance when considering the possibilities of substantial improvement in the economy during the coming decade or so. It is obvious that there are major negative labor productivity effects which stem inevitably from the degree of combined full employment and job security currently existing in the Soviet Union. If

*Except where otherwise mentioned, the source for this Comment is David Granick, *Job Rights in the Soviet Union: Their Consequences*, Cambridge, England: Cambridge Univ. Press, forthcoming 1987.

**Professor of Economics, University of Wisconsin-Madison.

¹ I estimate this crudely as having been between 1.5 and 3 per cent, and most probably below 2.3 per cent, in the late 1970's (Granick, *ibid.* p. 81). Paul R. Gregory and Irwin L. Collier, Jr., based on data from the American Soviet Interviews Project, offer a lower-bound estimate of 1.2 per cent for unemployment exceeding one month (Gregory and Collier, "Unemployment in the Soviet Union: Evidence from the Soviet Interview Project," Soviet Interview Project Working Paper, 1987). One month is roughly the average period between jobs for a Soviet manual worker; one may guess that it is so long, despite Soviet labor market conditions, partly because workers use job change as an occasion to take unpaid and unrecorded vacation.

² Dismissals for fault appear to average annually some 1 to 2 per cent of the industrial manual labor force; dismissals after a short probationary period for inability to perform the assigned work are virtually nil; and redundancy dismissals (which include compulsory shifts to other jobs within the same enterprise, as well as normal quits from jobs that would have otherwise been declared redundant) are at an upper-bound annual level of 1.2 per cent. The total of such "dismissals" in industry seems to be 2 to 3 per cent annually of the industrial labor force. These data are for the second half of the 1970's (Granick, *op.cit.*, pp. 88-99).

³ See Philip Hanson in David Lane (ed.), *Labour and Employment in the USSR*, Brighton: Wheatsheaf Books, pp. 85-86, and Joseph S. Berliner, *The Innovation Decision in Soviet Industry*, Cambridge, Mass.: The M.I.T. Press, 1976, pp. 168-69.

⁴ Lexicographic preferences are those which are given absolute priority, and this for one hundred per cent fulfillment, over all other preferences.

these phenomenon are a result of the overheating of the economy, then it seems likely that nothing much can be done about them without undertaking such basic marketization reform as would eliminate what János Kornai has described as the "soft budget constraint" of socialist economies. Since such reforms would have to go much farther than the Hungarian reforms have proceeded to date, drastic marketization strikes me as representing such fundamental system revision as to be most unlikely. On the other hand, the second explanation for the observed phenomena suggests that their removal would require no system reform—although, of course, there would still be major political obstacles to such removal.

The overheating explanation implies that the resistance to the sort of change needed to eliminate the excesses of full employment and job security might be expected to come from those opposed to system reform; such groups have in the West customarily been identified, correctly or incorrectly, with middle-level Party and ministerial functionaries. The alternative explanation suggests that the opposition might have a far more popular base; the implicit-contract variant of this explanation indicates that the opposition would be found in at least a major segment of the mass of workers and employees in the state sector.

DIRECT EVIDENCE AS TO CHOICE OF EXPLANATION

Dismissals.—The overheating hypothesis has a corollary that one should be able to find dismissal rates in capitalist countries in individual boom years that are as low as those in the Soviet Union. To test this, we may look at dismissals in American manufacturing during the five years of 1930-74 when they were at their lowest as a proportion of the labor force. An underestimate of such dismissals, but one for which data exist, consists of "layoffs"—defined in the American statistics as suspensions without pay that last or are expected to last more than seven consecutive calendar days and are initiated by the employer without prejudice to the worker. Not surprisingly, four of the five years when dismissals so defined were at their lowest fell during the Second World War.

During these five super-boom years, annual layoffs as a proportion of the manual labor force in American manufacturing ranged between 8.4 and 19.2 percent. No matter how low a proportion of the "other separations" (excluding quits) category in American B.L.S. statistics should also be considered as constituting dismissals, we are dealing with total-dismissal figures that in these lowest years were many times higher than the Soviet figure which, using a much broader definition, was 2 to 3 percent. They seem most comparable with Soviet dismissals other than for fault, roughly a 1 percent figure.

Experience of other socialist countries.—Protection against dismissals seems to be a universal of socialist countries. Although most of these countries operate in the same overheated conditions as does the Soviet Union, this cannot be said for either Yugoslavia or China; neither of the latter two have any labor shortage. The overheating hypothesis fails to explain the observed degree of job rights in these two socialist countries, while the alternative explanation is fully consistent with such observation.

Mix of hirings.—The overheating hypothesis predicts that the Soviet enterprise is always desirous of hiring more labor than is available to it. However, one of the leading Soviet labor economists in the mid-1970s noted that about one-third of the personnel who voluntarily come in search of employment to the municipal employment offices, and who are sent by them to would-be employers who had indicated job openings, are rejected by the employers (enterprises).⁵

Quits and absenteeism.—Both of these might be expected to be peculiarly great in a country suffering from a permanent state of overheating. Nevertheless, comparison of the Soviet quit rate with that in the United States during 1958-74 does not show the Soviet rate to be particularly high. Similarly, data as to total separations in the United Kingdom and in the German Federal Republic during prosperous years fail to indicate especially high Soviet quit rates by international standards.

Despite the many Soviet complaints regarding absenteeism, available data do not suggest that the Soviet rate of industrial full-day absenteeism is out of line with data from Western countries.⁶ When we define absenteeism broadly as constituting all absences from the job other than paid vacations and recognized holidays (any narrower definition could lead to very misleading comparisons), Soviet data show some eighteen to twenty-one annually. Western data for 1981 and 1983 show the Netherlands and Italy to have roughly the same degree of absenteeism as the Soviet Union had in 1974, West Germany to be 83 to 97 percent of the Soviet figure, Sweden to be 150 percent, but the United States to be only 40 percent. The ranking of these nations according to absenteeism seems to be satisfactorily accounted for by the degree to which such absenteeism is paid for by the employer.

CONSEQUENCES OF JOB SECURITY

Whatever may be the reasons for the overfull employment and high degree of job security found in the Soviet Union, a result is the absence of the "discipline of the marketplace" operating on the individual worker. Without such discipline, we observe for the least efficient category of workers the degree of drunkenness on the job and low level of effort at the workplace which have become a commonplace in discussions of the functioning of the Soviet economy.

If the cause of this excessive job security is the overheating of the economy, then the absence of such "discipline" is the sole consequence. However, if the alternative explanation is credited, then various additional consequences follow. All of the latter result from actions which central authorities take either as a requirement for providing to enterprise managers a source of motivation which is needed to ensure the desired degree of national job security, or as a rational adaptation to the conditions generated by such job securi-

⁵ I. S. Maslova, *Ekonomicheskie voprosy pereraspredeleniia rabochei sily pri sotsializme*, Moscow: Nauka, 1976, p. 191. The one-third reject figure has the individual job referral as its unit. It is of course possible that, as Peter A. Hauslohnner has suggested to me privately, Maslova either misspoke herself or was misinterpreting the underlying data. However, so far as I am aware, there are no Soviet data specifically in contradiction to these.

⁶ No data are available, either for the Soviet Union or for other countries, as to part-day absenteeism. It is true that Soviet complaints about absenteeism refer particularly to this type.

ty. These consequences are difficult to explain in a logically economical fashion, as results stemming from a single hypothesis, except by adopting the contract/preferences, rather than the overheating, explanatory hypothesis.

The first of these consequences is the inability of central authorities to control detailed product mix produced within a given assortment category which is itself laid down in the production plans set for enterprises. Furthermore, such detailed product mix is unresponsive to user desires, and is determined in what must be considered an anarchistic manner when judged either from the viewpoint of the Center or from that of the user.⁷ If it were not for the constraint introduced by the implicit contract or by lexicographic preferences of its own, the Soviet leadership could introduce a modified form of the current pricing system which would have only advantages. Such a scheme would retain all of the features of the current one which appear desirable from the viewpoint of maintaining the full authority which the Soviet Center is currently capable of exercising, and would also eliminate the anarchy cited above.

A second consequence is the distortion of the composition of fixed investments so as to make them extensive rather than intensive. Specifically, labor-saving fixed investments systematically fail to be undertaken despite the fact that labor shortages lead to an inability of the economy (or even of industry alone) to utilize fully the fixed productive capital stock that has been and is currently being built. The failure of central decisions during the past two decades in this regard, regardless of whether it be unskilled or skilled manual labor that would be economized, seems hard to explain on other grounds.

A third consequence, this time stemming from the overfull employment rather than the job security aspect of the contract/preferences interpretation, consists of what must be considered as overexpansion of formal education at various levels if such expansion is viewed in customary fashion from the standpoint of investment in human capital. The most obvious example of this is the case of the graduates of junior colleges (*tekhnikumy*) working in industry. The proportion of junior college graduates in industry as a whole who work there as blue-collar workers rose from only a few percent in 1952 to 20 percent in 1968, thereafter steadily to 33 percent in 1975, and currently seems to be even higher. Furthermore, there are no indications in the Soviet literature that an inordinately large number in this group are those graduates, to be found particularly in specialties such as education, agriculture or health, who have abandoned their original fields without having skills relevant to industry. The degree of expansion of formal education in the Soviet Union seems inexplicable when viewed as an investment in human capital except if one hypothesizes an adjustment by central authorities to their expectation of a continuation into the future of various consequences of the centrally-desired degree of job security. With this hypothesis, however, it becomes perfectly con-

⁷ It should be noted that the argument for this position was made incorrectly by the author in Steven Rosefield (ed.), *Economic welfare and the economics of Soviet socialism: Essays in honor of Abram Bergson*, Cambridge, England: Cambridge Univ. Press, 1981. The argument is considerably reworked in Granick, *Job Rights in the Soviet Union: Their Consequences*, Chapter 5.

sistent with the economic interpretation of educational expenditures.

A fourth consequence lies in the realm of incentives operating at the workshop level. Poor individual productivity can be viewed as a response to organized group pressure on the rate buster who increases his work effort beyond the "normal," with this pressure resulting from the anticipation by the group of working of the ratchet effect in the formation of each production unit's future planned wage fund. Such group pressure can be seen as instrumental in serving the leadership's overfull employment objective. It obviates what would otherwise be pressure by such blue-collar workers against hirings by their own enterprises which are designed to implement a policy of creating and maintaining overfull employment within the narrow geographic district at the expense (because of diminishing returns) of average labor productivity—and thus of average per worker current available wage fund—in the individual enterprises. In the light of stochastic reductions in labor demand and in allocated current wage funds in other enterprises, that together reduce the gross hirings by such units in the face of a constant quit rate and which thus cut back these units' stock of workers, such compensatory net hiring is required to avoid local unemployment. Here is an explanation for the substantive failure of Soviet leadership to relax the "ratchet" involved in the planning of enterprise wage funds.

EVIDENCE OF CHANGE IN JOB SECURITY

Three events in recent years have been cited in Western sources as evidence of a change in the degree of job security existing in the Soviet Union. As is usually the case with isolated evidence of change, however, earlier parallel instances can be found from which no change resulted. Changes often look biggest to those without the knowledge provided by historical perspective.

In 1984, the Supreme Court implicitly reinterpreted the current legal position as negating the 1928 law that an enterprise is responsible for finding another suitable job for a dismissed worker. But both in 1957, and once again in 1962, the Council of Ministers of the Soviet Union had formally cancelled such enterprise responsibility—without these decisions having had any effect.

In January 1986 there was apparently a government decree legislating up to three months' unemployment compensation, at full pay, for personnel dismissed as a result of a reorganization of agricultural ministries and state committees. But sixteen years earlier, the same three months' income at full pay was offered to administrative personnel, then dismissed as a result of modernization of the administrative apparatus, who used the period to learn a production trade. Both instances were similar in that they were governmental efforts to ameliorate the effects on a small group of individuals of limited and very specific measures which cut purely administrative staff and were in sharp violation of the normal mores of Soviet society.

Still more recently, we have been reading reports of dissatisfaction by public figures with the non-dismissals policy. But such reports are not new under Gorbachev. Rather, dissatisfaction has for

some time been voiced by various Soviet writers and professionals. This is an area in which differences of opinion have been freely accepted.

FUTURE PROSPECTS

This Comment suggests that major improvements in the Soviet economy's ability to generate income are possible (although some, of course, only with a considerable time lag) without any system reform in the sense of greater marketization. Steps toward such improvement might also avoid the particular political barriers to reform which have been commonly noted by Western political analysts. However, such improvements—carried out through a reduction in the degree of regional full employment and most particularly of job security—would be likely to evoke mass hostility in the population.

One might suspect that increases in productivity would have to be large and rapid, and be translated with little time lag into improvements in living standards, for the suggested worsening of work conditions to be worthwhile in the estimation of the Soviet man in the street. Here would be a bold gamble, with a potentially large pay-off, which Gorbachev might undertake. The risks in such a gamble would be serious, and there is no reason to think that Gorbachev would wish to suffer the resulting unpopularity from the suggested steps. But what is significant for my purposes here is that the gamble represents great potential gains in production without any change in the economic system, and that the political opposition would come from sources other than those normally pointed to in Western analysis of reform opportunities.

ADDENDUM

A FREQUENTLY MISUNDERSTOOD ASPECT OF THE SOVIET LABOR MARKET

It is the role of Soviet wage rates, which remain constant for long periods of time, that in my opinion is badly misunderstood. As neoclassical economic theory would suggest, these relative rates bear only a limited relationship to relative on-the-job earnings of different categories of labor. Given that the supply of different types of labor at different locations is allowed to adjust to earnings in a fairly free marketplace, and that the demand for such different types of labor changes over time, it would be hard to believe that labor-prices which stay constant for as long as fifteen years at a stretch could be the ones which are equilibrating labor markets. It is true that goods-prices of producer goods similarly remain constant for long periods; but in such markets for goods, rationing is substituted for equilibrated markets. Labor markets, on the other hand, go largely unrationed.

How, then, are labor markets (at least in the domain of *khovraschet* enterprises) equilibrated? By allowing relative earnings of different types of labor to vary freely—i.e., to be labor-prices that are market determined—within the two constraints that each enterprise be limited to total monetary expenditures on labor that are kept within its allotted wage fund, and that each type of worker receive at least the legislated minimum earnings (i.e., the wage

rate for the job). Of the two constraints, the second is generally non-binding. Thus an enterprise employing both engineers and manual workers can vary their relative earnings so as to meet the market pressures bearing on the enterprise; but the relationship between the earnings of coal miners and textile carders (despite both presumably being predominantly male) is only very tenuous and indirect.

For this reason, changes in wage rates are not significant for their direct effect on earnings, but rather primarily for their indirect effects through the medium of the relative wage funds given to different sorts of enterprises by higher authorities. The effects of central policy are much more limited than is often suggested.

One implication of this market-equilibrating function of labor earnings is that the considerable leveling of earnings that has occurred within Soviet industry in recent decades should not be credited to central policy, acting perversely to reduce incentives for higher skills and better work. Instead, it seems to be a direct result of pressures within the labor market itself, resulting from a major upgrading (through education) of the labor force without a comparable upgrading of the skill demands made by those technologies that have been widely implemented in production practice. Soviet complaints to the contrary come from precisely that group of people who have suffered most from developments in the labor market: those with complete or incomplete higher education. This group can scarcely be taken to be an unbiased source of information.

A second implication is the rebuttal of the view that labor hoarding in Soviet enterprises is both pervasive and is created by the system, a phenomenon explained by the relative "costlessness" to management of employing additional personnel. Exponents of this view argue that the cost to the enterprise of additional hirings is only financial, and that financial cost is of minor importance to the enterprise. Furthermore, they claim, such labor hoarding constitutes risk avoidance by enterprise management. To the contrary, it appears to me that the opportunity cost to the individual enterprise of labor hoarding is high: this cost is the inability to offer sufficient earnings so as to retain current scarce employees in the face of bids by enterprises who follow a different strategy. Skill, and particularly enterprise-specific skill learned on the job, is traded off for the employment of larger numbers of personnel who are individually paid lower earnings. It is unclear which enterprise strategy, in general, is riskier; this must depend upon specific local and sectoral conditions.

I do not find it surprising that the only systematic information of which I am aware fails to point particularly in the direction of labor hoarding. According to Paul R. Gregory, only 35 percent of the respondents in the American Soviet Interviews Project believed that the number of personnel in their last Soviet work organization could have been reduced by ten percent or more without jeopardizing fulfillment of output targets.⁸ I would suspect that a similar

⁸ Paul R. Gregory, "Productivity, slack, and time theft in the Soviet economy," in James Millar (ed.) *Politics, Work, and Daily Life in the Soviet Union*, New York: Cambridge Univ. Press, forthcoming 1987.

proportion of American employees of large firms would see in their own companies possibilities for an equal economizing of labor force.

COMMENTARY

By Peter Hauslohner*

The authors of these papers agree on two points. First, Soviet citizens are unenviable consumers. Although living standards have risen dramatically since the Stalin era, the rate of improvement has fallen sharply in the last fifteen years, and the gap with the West no longer is diminishing. To be sure, prices for food and other basic items have been kept low, and key services (e.g., housing, healthcare) are heavily subsidized or provided *gratis*. But quality is often poor, and shortages abound. Particularly striking, and yet indicative of the low priority accorded consumption until now, are the extraordinarily underdeveloped service sector and the population's—and state's—astonishing resort to and dependency on alcohol.

The authors also agree that Gorbachev has set in motion major, and potentially far-reaching, changes in state policy. Plans to raise real incomes by half and to double the annual output of consumer goods and services by the end of the century suggest a qualitatively new commitment to the consumer. Especially important, and long overdue, are the fundamental improvements slated for housing, healthcare, and consumer services. Just as striking, however, are the policy instruments now gaining favor: a deliberately anti-egalitarian wage policy, a greater willingness to force layoffs of redundant workers, rent hikes, a larger role for individual and cooperative enterprise, and, possibly, price increases for food. In short, Gorbachev and his fellow leaders evidently have a much greater appreciation than their predecessors of the reciprocal connections that exist between social policy and economic performance. They seem to understand that social expenditure can no longer be treated as merely a "residual" in national economic planning. And they appear receptive, in principle, to the need for "radical" institutional and policy reforms.

But what about the likely scope and effects of these changes? Here, the authors are divided and, on the whole, relatively skeptical. My own view is more optimistic, and part of the reason is that I judge the prospects to be good for two specific policy changes (both little discussed in these papers) which, if pursued vigorously, should have a large positive effect on consumption generally, and on a variety of the more specific problems described earlier, ranging from the absorption of displaced workers to the success of the anti-alcohol campaign. One change is consumer price reform, which in the Soviet context has come to mean price increases not only for food, but also for education, housing, healthcare, and other

*Department of Political Science, Yale University.

subsidized goods and services. The second change is the widely-reported effort to expand the role of individual employment—or, as some would put it, to legalize a large part of the “second economy.”

The purpose of this comment is to draw attention to these two issues and to the enormously interesting debate about them that has erupted in the Soviet media. Three points emerge from the discussion. First, the near-term prospects for improvement in consumption are probably brighter than the authors here believe, because the issues of price reform and individual employment have moved onto the political agenda and stand a good chance of being resolved in the reformers' favor. Second, the debate has much to tell us about the character of the opposition to reform; it suggests that Gorbachev's main “opponent,” at least with respect to social policy, is the public not the bureaucrats, and that part of the resistance to reform is normative—based on shared values—and thus particularly difficult to defeat. Yet, and this is the third point, there are powerful underlying social and economic forces operating in favor of reform, which make it likely that major political-economic changes will proceed, whether Gorbachev survives politically or not.

THE PROSPECTS FOR CONSUMPTION

Much of the authors' skepticism concerning the prospects of rapid improvement in consumption is based on the resource shortage presently constraining all sectors of the Soviet economy, and on the lack of evidence that a significant reallocation of funds into the consumer sector has been planned. By comparison, several leading Soviet reformers have begun to argue that a lack of resources is perhaps not the major problem, and that an “extensive” approach to social policy is certain to be inefficient if not wholly ineffective. Their position is that various consumer markets will never be brought into equilibrium and the public's discontents will never be significantly reduced, until measures are taken to curtail consumer demand, reduce waste, and rationalize both sides of the supply-demand equation.¹ Thus, some specialists have come to see consumer price reform and a partial “destatification” of the production and distribution of consumer goods and services as necessary components of an effective social policy. They are undoubtedly right. That this view is gaining adherents and that these issues have now moved onto the leadership's policy agenda suggest that the probability of rapid gains in consumption is greater than if one were to look at this question only from the standpoint of resources available.

But if that's right, then why are these issues given so little attention in this section's papers? It is not because the authors think the issues unimportant; quite the contrary. Rather, one senses that most of the authors doubt that reform will proceed far enough to make a difference. Their reservations seem to be due to a combination of factors: (1) the modesty, and even ambiguity, of the measures taken so far; and (2) a healthy respect for the intense opposi-

¹ Zaslavskaya, 1986, pp. 71-73; Rimashevskaya, 1986, p. 66; Latsis, 1987, pp. 77ff.

tion which these proposed changes have already aroused. Let us look at this question more closely.

It is true that the policy changes introduced to date have been modest and contradictory. The law on individual employment, which went into effect May 1, 1987, is exemplary in this respect. It breaks almost no new ground, endorsing a long list of activities most of which are already legal; and its drafters evidently intend to limit participation of the able-bodied to those already working full-time jobs in the public sector. Meanwhile, measures enacted just a year before, as part of the effort to root out corruption and nonlabor income, have so far had the practical effect of discouraging precisely the kinds of individual initiative that the new law is supposed to promote. As for price reform, the decision to raise some rents has been taken in principle, but the rules and legislation have yet to appear. There has been much public discussion of price adjustments for food and, more recently, healthcare, education, and other services, but no decisions have been reached. Finally, what might be viewed as an attempt to raise food prices indirectly, by allowing farms to sell a large portion of their planned output through their own stores and collective farm markets, has so far had but a very slight effect.²

However, this is putting too negative a face on things. From a tactical standpoint, it is surely better that the attack on nonlabor incomes was launched before the new law on individual employment was issued. The negative consequences of a more punitive approach to regulating the private sector have been demonstrated, and it will doubtless be easier than before to contain the complaints about "excessive" incomes which are bound to arise. More importantly, local authorities are to play the leading role in supervising implementation of the new law, and so much will depend on whether these authorities are provided with the right incentives. If local governments are allowed to share in the revenue generated, and if restrictive pressures from above are held in check, there is every reason to suppose that individual enterprise will thrive—just as there is every reason to suppose the opposite should these conditions not obtain. As for price reform, although major decisions have yet to be taken, the sequencing of events so far appears enormously wise. The plan to adjust apartment rents has been overshadowed by the regime's newly-enlarged building program, which is just as it should be from the standpoint of good politics. The "indirect" approach to food price increases seems equally sensible: not only is it less conspicuous but part of the rise in prices ought to be offset by an increase in production. The fact that this approach has not had much impact as yet can be attributed partly to the farms' inexperience and partly to barriers set up by local officials. But those barriers ought to fall if the right incentives are provided and if the Center's support remains firm.

In both cases, sustained leadership backing is crucial, and while evidence is thin, that evidence which exists indicates substantial elite support for these reforms on substantive grounds, tempered by significant caution. This conclusion is suggested, first, by Gorba-

² See Aliyev's Volgograd speech in *Pravda*, March 18, 1987, p. 2.

chev's own, sometimes elliptical statements, the occasional statement by other prominent figures, and what appears to be the journal *Kommunist's* relatively subtle, though unmistakable, endorsement.³ The latter is difficult to explain, I think, unless one assumes that support for these ideas goes beyond Gorbachev to include a sizable number of other top leaders. Evidence also comes from the considerable attention and frank advocacy that both reforms have received recently in the media. What stands out here is the seeming confidence with which the reformers have expressed themselves and the tone of resignation on the part of officials who are not enthusiasts themselves, but who evidently recognize the underlying social and economic forces driving these changes.⁴

THE PUBLIC DEBATE

What explains the politicians' caution? There seem to be two reasons: (1) the technical complexity of the issues, which must account for much of the bureaucracy's reservations; and (2) the extent and character of the opposition emanating from within society. Both of these points are nicely illustrated in an extraordinary debate that has developed over social policy reform in the Party's leading theoretical journal, *Kommunist*, following a particularly forthright article by Academician Zaslavskaya.⁵ This discussion is notable both for what it tells us about the nature of the controversy and, equally important, for the fact that these issues are now being thrashed out in a rather sophisticated and straightforward manner, not in small-circulation media, but before the elite as a whole. What has developed is a remarkable, and remarkably inclusive, process of collective deliberation about issues of the gravest magnitude.

That the issues to be decided are genuinely difficult is not always fully appreciated in the West. For example, barring a truly exceptional increase in supply, even the partial deregulation of prices for food, housing, and medical care will mean a major reduction in real incomes, unless the subsidy is given back to the population in the form of income supplements. Yet, even if all of the subsidy is returned, the complexity of existing consumption patterns virtually assures that some individuals, and possibly large groups, will suffer real income losses regardless.⁶ Furthermore, the proposal to eliminate existing subsidies has led some to suggest price reductions on goods (e.g., automobiles, consumer durables) from which the state presently reaps a sizable windfall thanks to huge turnover taxes, a policy that is arguably as distorting in its effects on the structure

³ See Gorbachev's Tselinograd speech and address to the 27th CPSU Congress in *Pravda*, September, 11, 1985, p. 2, and February 26, 1986, p. 5; Volgograd province party first secretary Kalashnikov's remarks to the Party Congress (met with extensive applause) in *ibid.*, March 2, 1986, p. 3; and the editorial commentary in "O chelovecheskom," 1987.

⁴ E.g., USSR State Committee on Labor chairman Gladkiy's Supreme Soviet speech in *Pravda*, November 20, 1986, p. 5; and Ministry of Finance official Tur's remarks in "Trud—individual'nyi," 1986, *passim*.

⁵ Major individual contributions include: Zaslavskaya, 1986; Shatalin, 1986; and Bim and Shokhin, 1986. See, also, the interesting roundtable discussion between two leading social scientists and a Ministry of Finance official, "Trud—individual'nyi," 1986; and the editors' summaries and reviews of replies from readers, "Mneniya," 1986, and "O chelovecheskom," 1987.

⁶ Meanwhile, the government will be tempted to retain at least a portion of the recaptured subsidy for other purposes. Zaslavskaya, for example, would use the money saved to finance a radical overhaul of the wage system, reaching far beyond the September 17, 1986 reform.

of consumer demand and producer incentives as the subsidies for food and housing.⁷ Yet, if price hikes on some goods and services are combined with price reductions on others, the ultimate distributive effects will be extraordinarily complex and virtually impossible to predict, leaving much room for unanticipated consequences and great political risk. Two of the participants in the *Kommunist* debate are surely right to urge development of a "strategy of reforming prices" and "compromise means of resolving the problem."⁸

On a less technical plane, Zaslavskaya has tried to build popular support for price reform, by arguing that the state's subsidy now goes predominantly to middle and upper income earners. This approach has evidently made some headway, although it is clear that many observers, particularly among the mass public, imagine the lineup of prospective "winners" and "losers" somewhat differently. One of the participants in the discussion criticized Zaslavskaya's "facile approach" to the issue, as evidenced by a "certain underestimation of the social-psychological, political, and moral aspects and consequences" of her proposals. He (and others) contended that the largest income differences derive not from public-sector earnings, but from private sector earnings and nonlabor incomes. The subsidies conveyed through low consumer prices, he continued, should by Zaslavskaya's logic fall disproportionately to these groups, on whose lives higher consumer prices can hardly be expected to have much of an impact—"something which cannot be said for the overwhelming mass of workers employed in the public sector."⁹ In fact, there is little doubt but that much of the public regards the prospect of consumer price increases with great suspicion and latent anger—and not merely for material reasons. When the editors of *Kommunist* summed up the first six months' discussion prompted by Zaslavskaya's article, they regretted not the controversy her price proposals had generated, but the relative lack of reasoned, dispassionate analysis. One letter quoted at length declared: "A rise in prices, even with compensation in wages, is not our way, is not the socialist way. The stability of retail prices on goods of primary necessity is our great achievement. We have spoken of this with pride for many years, and it's not right to cross out at one stroke the good and the humane which we received as an inheritance from past decades."¹⁰

While price reform obviously threatens to deprive individuals and groups of tangible benefits, relaxing restrictions on individual employment would seem to involve no concrete deprivations at all. Yet, it is clear that here, too, reform is confronting a similar mix of technical, political, and moral objections. For example, even the most ardent defenders of reform concede that liberal rules on individual employment could lead to a sizable outflow of manpower from the public sector, and that the proper oversight and efficient taxation of private sector incomes will require a far more sophisticated tax policy and auditing apparatus than the government dis-

⁷ Bim and Shokhin, 1986, p. 70.

⁸ Ibid.

⁹ "Mneniya," 1986, p. 64.

¹⁰ "O chelovecheskom," 1987, pp. 107, 108.

poses of presently. The labor issue is particularly complicated, given the exceptionally taut labor market and the slow growth of labor supply expected over the next decade, and it is clear that some planners are quite nervous about the individual employment law for these reasons, despite the fact that leading economists are persuaded that rapid expansion of the service sector—which is arguably impossible without the rapid growth of individual and cooperative enterprise—is essential, given the huge layoffs anticipated in goods-production branches by the end of the century.¹¹ Questions of tax policy are more complicated still. Among other things, policymakers are concerned about the disincentive effects of high marginal rates, they understand the importance of and difficulties involved in setting rates so as to avoid large earnings disparities between comparable public and private sector workers, and they recognize the enormous bureaucratic burden connected with monitoring incomes and enforcing tax laws.¹²

Again, however, the debate suggests that political and moral, rather than technical, complications are the more important barriers to reform. One of the clearest manifestations of this is the way supporters, beginning with Gorbachev at the 27th Party Congress in February 1986, have sought to legitimize individual employment theoretically.¹³ On a more practical level, one is struck by the seeming pervasiveness of popular demands that firm ceilings be imposed on free market prices.¹⁴ And there is the obvious prejudice which many ordinary citizens harbor toward this sector, and the difficulty some people have in trying to understand the rationale for the policy changes now under consideration. "Daily observances," writes one contributor to the *Kommunist* debate, "show that super-high incomes are earned by persons who are individually employed. T.I. Zaslavskaya believes that high payment in such cases is justified, since this labor is highly effective and good for society. Needless to say, individual labor activity must occupy an appropriate place in the economic structure, and it is inexpedient to restrain it artificially. But, honestly, I do not understand why less progressive forms of labor are better for society than more progressive [forms]." ¹⁵

In sum, Teague is surely right to single out public opposition as a major constraint on social policy reform. Yet, her conclusion is at once too strong and not strong enough. On the one hand, the technical obstacles to reform are real and genuinely intimidating. The lack of an IRS-equivalent, not to speak of reliable instruments for measuring in timely fashion the complex and subtle changes in aggregate price levels, incomes, and overall distribution that will accompany reform, would make policymakers in any system cautious, regardless of the opposition. On the other hand, the evidence sug-

¹¹ On planners' anxieties, see Gladkiy's Supreme Soviet speech (fn 4). On anticipated layoffs, see the remarkable pair of articles by Gosplan economist Kostakov, "Odin kak semero (One as Seven)" and "Chelovek i progress (Man and Progress)," *Sovetskaya kul'tura*, January 4 and February 1, 1986, p. 3.

¹² E.g., "Trud—individual'nyi," 1986, passim; and labor committee chairman Gladkiy's interview, "Kto vyigryvayet (Who Wins)," *Pravda*, November 29, 1986, p. 3.

¹³ See, especially, Latsis, 1987; and the comments by the economist, Lushina, in "Trud—individual'nyi," 1986.

¹⁴ E.g., "Vo imya," 1986, p. 91.

¹⁵ "Mneniya," 1986, p. 66.

gests that the strongest substantive objections to these proposals—and, by implication, the main cause of the politicians' hesitancy—are coming not from within the elite but from, or on behalf of, the mass public. Moreover, what Teague does not fully capture, and what the Western discussion to date has almost wholly ignored, is the normative dimension of this opposition. Obviously, opponents include numerous individuals and groups whose benefits are threatened by reform. But the opposition also seems to draw considerable force from a relatively inchoate, yet widely shared, sense that reform would mean the surrender of key values and some of the major social accomplishments of Soviet power—that Soviet society would become less “socialist” and less humane as a result. Achieving price reform, a sustained expansion of individual employment, and other controversial elements of radical reform will thus require considerable political skill—and time. It may necessitate a new “social contract,” as Teague suggests and as I have argued elsewhere: i.e., a new mix of material benefits, participatory rights, and welfare guarantees designed to ensure the public's compliance and support.¹⁶ But ultimately, if reform is to endure, a new definition of socialism will have to be constructed and propagated as well, a socialism capable of accommodating price instability and a larger private sector, which retains links with the past and a clear distinctiveness vis-a-vis other political-economic formations. This is a far more complicated and uncertain enterprise than mobilizing a coalition of interests in favor of reform.

FORCES IN FAVOR OF CHANGE

Finally, although one should not ignore the difficulties besetting Gorbachev, neither should one exaggerate them. Besides the opposition, there are powerful forces operating in favor of reform, which make any sustained return to the social policies of the 1960s and 1970s, let alone those of the 1940s or 1950s, virtually impossible.

One is a decided change in intellectual fashion. One of the least appreciated aspects of the latter half of the Brezhnev period is that, among policy specialists, the rethinking of old approaches and the discrediting of old orthodoxies continued apace—something which the conservative politics of the era could hide but not halt. This is easiest to document for incomes policy, in which case the weight of opinion favoring a sharp rise in differentiation now seems quite substantial. More surprising, perhaps, is the only slightly less dramatic erosion of intellectual support for overfull employment.¹⁷ The views of policy specialists as a group are least clear with respect to consumer price reform and individual enterprise, although there must have been movement here as well. One of the more remarkable aspects of the current discussion is the speed and sophistication with which persons from a variety of backgrounds have taken up the argument. The causes of these changes are complex. Generational turnover is undoubtedly part of the explanation. Yet, it is also clear that a good deal of “social

¹⁶ For my views, see Hauslohner, 1987.

¹⁷ See the brief discussion in *ibid.*

learning" occurred under Brezhnev: that growing numbers of specialists came to realize that long-held (and rarely questioned) beliefs about the causes, consequences, and remedies of social problems could no longer stand empirical scrutiny. This is not to deny the considerable dissensus that exists within the social policy community. On the other hand, I am more impressed by what seems to have been literally a sea-change in the Soviet intelligentsia's collective perspective on the whole gamut of social policy issues.

A second powerful force driving reform arises from a fundamentally changing social structure, as measured by continuing urbanization and the slow but steady shift towards a post-industrial "service economy," and by the dramatic rises in levels of education and affluence. The effects of these changes are numerous and complex, but are especially marked with respect to the structure of consumer demand.¹⁸ A good illustration, as Christopher Davis' paper shows, is medical care which is a "superior good" in the Soviet Union (as elsewhere), in the sense that the public's demand for it rises faster, relatively speaking, than the public's income. At the same time, changing environmental conditions—increasing pollution, the growing use of alcohol and tobacco, exposure to other carcinogenic substances, a more dangerous workplace, and so forth—likewise contribute to a heightened and more complex demand for medical services. There are two major consequences to be considered. First, the increasing differentiation and instability of consumer demand virtually require greater price flexibility and disaggregated production and distribution, if consumer discontents are to be held in check. In this sense, the pressures favoring consumer price reform and a shift to small-scale, specialized production are becoming irresistible. Secondly, these forces, plus the size and complexity of the economy, mean that if sufficient goods and services cannot be supplied legally, they will inevitably be supplied illegally, through corruption and the second economy—an outcome that is arguably as debilitating in its long-run effects on political stability as unsatisfied consumer demand. A leading advocate of the expansion of individual employment writes: "But if widespread private services are rendered in practice and if the demand for them exists objectively, then it is preferable to legalize already existing individual service 'enterprises,' than to keep them outside the law. Pressuring them with the forces of the security organs in no way solves the socio-economic problems (the supply of services), and indeed works poorly for the reason that the public, which is objectively interested in these services, does not provide mass support in [the security organs' efforts] to uncover them."¹⁹

To sum up, Western analysts must understand that the current drive for reform in the Soviet Union arises not just from Gorbachev's personality or the pressures of East-West competition. It also derives from major changes in Soviet elite thinking and from the pressures and discontents of a social structure whose development has outraced old, and increasingly obsolete, institutions and policies. Thus, while there is much domestic opposition to Gorbachev's

¹⁸ The link between social structural change and the drive for reform is discussed in *ibid.*; and in Ruble, 1987.

¹⁹ Latsis, 1987, p. 80.

program, there is considerable latent support as well. If Gorbachev leaves office tomorrow, these forces will still be there, continuing to grow in strength, and no successor will be able to ignore or to suppress them for very long.

REFERENCES

- Bim, A. and A. Shokhin, "Sistema raspredeleniya na putyakh perestroyki (The Distribution System on the Rails of Restructuring)," *Kommunist*, No. 15, 1986, pp. 64-73.
- Hauslohner, Peter, "Gorbachev's Social Contract," *Soviet Economy*, vol. 3, 1, 1987, pp. 54-89.
- Latsis, O., "Individual'nyi trud v sovremennoy sotsialisticheskoy ekonomike (Individual Labor in the Contemporary Socialist Economy)," *Kommunist*, No. 1, 1987, pp. 74-82.
- "Mneniya i predlozheniya (Opinions and Suggestions)," *Kommunist*, No. 17, 1986, pp. 61-68.
- "O chelovecheskom faktore i sotsial'noy spravedlivosti (On the Human Factor and Social Justice)," *Kommunist*, No. 3, 1987, pp. 97-108.
- Rimashevskaya, N., "O putyakh effektivnogo resheniya sotsial'nykh problem (On the Means of Effectively Solving Social Problems)," *Kommunist*, No. 2, 1986, pp. 59-68.
- Ruble, Blair A., "The Social Dimensions of *Perestroyka*," *Soviet Economy*, vol. 3, 2, 1987, pp. 171-183.
- Shatalin, S., "Sotsial'noye razvitiye i ekonomicheskii rost (Social Development and Economic Growth)," *Kommunist*, No. 14, 1986, pp. 59-70.
- "Trud—individual'nyi, pol'za—obshchaya (Labor—individual; Its Use—General)," *Kommunist*, No. 18, 1986, pp. 24-29.
- "Vo imya sotsialisticheskoy spravedlivosti (In the Name of Socialist Justice)," *Kommunist*, No. 15, 1986, pp. 85-96.
- Zaslavskaya, T., "Chelovecheskiy faktor razvitiya ekonomiki i sotsial'naya spravedlivost' (The Human Factor in the Economy's Development and Social Justice)," *Kommunist*, No. 13, 1986, pp. 61-73.

IX. REGIONAL DEVELOPMENT, TRANSPORT, AND THE ENVIRONMENT

OVERVIEW

By Donna L. Gold*

In his attempt to get the Soviet economy moving once again, Mikhail Gorbachev has chosen to break with the long-standing Brezhnev policies of promoting new investments and relying on traditional technologies. Instead, the new leader is currently focusing on the intensification and modernization of existing Soviet plants and equipment and on scientific and technological advancement. This change of emphasis is particularly evident in Gorbachev's approach to regional development, which appears to favor the western regions of the USSR over Siberia.

According to Theodore Shabad in "Siberian Development Under Gorbachev," the 12th Five-Year Plan is explicit in its emphasis on furthering western development over eastern development. For example, Shabad cites the pronouncement in the 12th Five-Year Plan that "material, financial and labor resources are to be concentrated mainly in retooling and rebuilding of existing plants" as illustrative of this preference. Although interest in Siberian development has been variable throughout Soviet history, it was an undisputed priority for Brezhnev, who championed the construction of the so-called "project of the century"—the Baikal-Amur Mainline (BAM) and its tributary area. This railroad was intended to connect the eastern portion of Siberia with the Pacific basin, providing resources for the western USSR as well as for export. By contrast, Shabad argues, Gorbachev appears hesitant to commit "an ever increasing share of investment resources to development in remote, unpopulated regions with a harsh climate and other hostile environmental conditions."

Notwithstanding Gorbachev's waning emphasis on Siberian development, Shabad cautions that Gorbachev's shift away from Siberia should not be seen as absolute. In fact, the region should be differentiated with respect to the areas east and west of Lake Baikal. Specifically, the region west of the Lake with its abundant oil and gas resources is to retain its importance "as a virtual raw material appendage of the economically developed European USSR." Likewise, the coal deposits of the Kuznetsk Basin are to be further developed under the 12th Five-Year Plan. The importance of the eastern section, however, has diminished, as evidenced by the rather limited guidelines for construction of the BAM and development of

*Graduate Fellow, RAND/UCLA Center for the Study of Soviet International Behavior.

the surrounding region included in the current Plan. What this stagnation in eastern Siberian development may portend, in Shabad's view, is a decreasing role for the Soviet Union in the world economy. Faced with declining foreign exchange from energy sales abroad, and lacking alternative mineral raw material exports, the USSR may ultimately face "reduced participation" in world trade.

Victor Mote in "Regional Planning: The BAM and the Pyramids of Power" does not see recent Soviet inattention to the BAM project as necessarily signifying its demise. Rather, in his view, it may be seen as a "temporary holding pattern," or as one stage in the projected thirty-year development of Eastern Siberia. Looking at the BAM project in an historical perspective, Mote explains that its planners prior to Gorbachev's rise to power envisaged three stages in its development, and accordingly the BAM project may indeed be on track. Specifically, the first stage (1985-1995) is to be a period of retrenchment or consolidation, in which the BAM infrastructure is to be built up; the second period (1995-2005) is to be a period of expansion, in which the development of the area's resources is to be extended; and the third period (2005-2015) is to be a period of completion in which the six territorial production complexes and five industrial nodes located in the BAM service region are to be completed. In sum, Mote concludes, the BAM program resembles "a trunk or a springboard for the future development of Siberia's most forbidding reaches, to which branches eventually will extend well into the twenty-first century (the 'tree of goals' concept)."

Mote likewise maintains that the BAM service area regional project may represent a major step toward the eventual adoption of program planning in the USSR. In contrast to most Soviet planning, which is confined to individual sectors of the economy, planning for the BAM project aims at dividing responsibility among a multiplicity of ministries. Gorbachev appears to favor this territorial or regional planning approach over traditional Soviet sectoral planning. Taken together with his appointment of Abel Aganbeyan—the innovator of the BAM project—as his chief economic advisor, comprehensive program planning may be the wave of the future in Soviet planning. According to Mote, "Gorbachev may be ready to lower the boom on departmentalism in regional planning." Hence, while the BAM project itself may be on hold, according to Mote, its value in terms of future Soviet planning is far from lost.

Furthermore, Mote maintains that the lack of attention to the BAM project in the 12th Five-Year Plan is not very surprising in light of the changed domestic and international situations now facing the Soviet Union. The rather poor state of the Soviet economy faced by Gorbachev upon his ascendancy to power coupled with the unexpected expenses incurred by the crises at the Severomorsk naval base in 1984 and the Chernobyl' nuclear plant in 1986 have no doubt affected Soviet finances. These expenses, along with the ongoing burden of the war in Afghanistan, may have forced Gorbachev at least in the short run to shift Soviet investment priorities.

Similarly, Gorbachev has had to come to grips with very different international market conditions than Brezhnev and this too may have contributed to Gorbachev's shift in investment priorities.

In particular, Mote notes that the current glut of copper on the world market has forced Japan, once a main target of prospective Soviet mineral exports, to exhibit minimal interest in Soviet copper. Consequently, the Udokan copper deposit is not included in the 12th Five-Year Plan. Likewise, the Japanese are no longer expected to be the anxious importers of asbestos from the still underdeveloped Molodezhnyy site. Wood and coal, by contrast, appear to hold the most promise for Siberian raw material exports in the near future, according to Mote.

Changes in both the Soviet domestic economy as well as the international economy may therefore account for Gorbachev's apparent lack of enthusiasm for Siberian development; whether this represents a long-term or short-term change, Mote concedes, is only a matter of conjecture at this time.

Uncertainty also surrounds the prospects for development in Soviet transportation. According to Holland Hunter and Vladimir Kontorovich in "Transport Pressures and Potentials," the transport sector is being squeezed in the 12th Five-Year Plan, and as a result expected freight traffic needs likely will exceed targeted growth in the transport system. Specifically, the total volume of freight traffic is expected to rise by 12 to 14 percent under the 12th Five-Year Plan while the total investment for the transport-communication sector is to represent 10 percent of aggregate fixed investment. Because of inflation, however, this increase will actually mean that in real terms the sector will receive less capital than it had previously. Hunter and Kontorovich thereby conclude that there is "no margin for averting bottlenecks during 1987-1990."

Bottlenecks are not a new phenomenon in the Soviet transportation sector, especially in the railway system. The years 1979 to 1982 were particularly troublesome for Soviet railroads. Although that downturn in Soviet railway operations was substantially reversed between 1983 and 1985, by increasing the gross weight (i.e., length) of freight trains, the long-term prospects for the Soviet railway system remain highly questionable. According to Hunter and Kontorovich, the Soviet railway system is more taxed than any other railway system in the world: "in combined volume of freight and passenger traffic carried per kilometer of line, Soviet railroads now bear the world's greatest burden." Unfortunately for the Soviets, those lines that currently are the most utilized are those that are expected to bear increasing burdens in the future. One Soviet study cited by Hunter and Kontorovich indicates that 50 percent of the network is operating at above capacity levels; an additional 14 percent is operating at full capacity.

The future of the Soviet railway system appears dependent upon improvements in railroad capital and plant equipment, according to Hunter and Kontorovich. Although the 1983-85 turnaround in railway performance was achieved mainly through increased organizational pressures from Moscow, this will prove to be an unacceptable solution in the years to come because "even if the railroads manage to meet the demands placed on them for a few more years, deteriorating track and rolling stock may cripple them in the 1990s." Problems of labor morale may be a further complicating factor.

Just as railroad transport appears problematic for the near future, so too does road transport. Specifically, Hunter and Kontorovich warn that road transport will face heightened pressure as the Soviet economy modernizes and the economy shifts from the production of bulk commodities to highly fabricated goods. Growth in road transport, however, declined absolutely in 1983-1985, despite rising demand. While there have been some signs of recovery in recent years, according to Hunter and Kontorovich, it nonetheless is clear that Soviet intercity movement is still "in its infancy."

In addition to the transport question, the issue of environmental protection has increasingly become a factor to be considered in regional development decisions, as discussed by Craig ZumBrunnen in "Gorbachev, Economics and the Environment." To some extent, Gorbachev's emphasis on raising the material, energy, and resource intensity of production reflects a recognition of the environmental consequences of continued extensive development. Nevertheless, ZumBrunnen describes a number of serious, continuing environmental problems and dilemmas that could constrain Soviet economic development in the long term: water pollution, water shortages, air pollution, and nature preservation. The nuclear accident at Chernobyl in 1986 and the long, sometimes acrimonious, debate over the Central Asian river diversion projects provide dramatic evidence of the urgent claims on scarce investment resources that must be decided by the Soviet leadership.

Gorbachev thus faces difficult challenges in terms of regional development, transportation, and the environment. In coping with these challenges, there are signs of policy change and continuity. In terms of regional development, the new leader appears to have decided to forego the Brezhnev priority of Siberian development—at least in the short run. In terms of transportation, the sector still lacks urgently needed investment.

How these short-term policies ultimately will square with Gorbachev's long-term goal of revitalizing the Soviet economy is a question only time can answer.

SIBERIAN DEVELOPMENT UNDER GORBACHEV

By Theodore Shabad*

CONTENTS

	Page
Summary	357
I. Introduction.....	357
II. Historical review of Siberian development	358
A. Eastward movement under Stalin.....	358
B. Post-Stalin policies.....	359
III. Gorbachev's economic principles	359
A. The catchwords of the Gorbachev program.....	359
B. The effect on Siberian development.....	360
IV. Differentiation within Siberia	361
A. Continuing importance of West Siberian resources.....	361
1. The oil and natural gas of West Siberia.....	361
2. The Kansk-Achinsk lignite and power project.....	362
B. Stagnancy in East Siberia and the Far East.....	362
V. The Baikal-Amur Mainline as an indicator of national priorities	363
VI. Implications for the role of Siberia in the world economy.....	364

SUMMARY

There are indications that interest in Siberian development is waning under the Gorbachev administration. The basic principles of the Gorbachev economic program, when analyzed in spatial terms, favor investment in the established manufacturing potential of the European USSR, but not in costly new resource projects in Siberia. The paper examines the evidence, pro and con, and draws implications for Siberia's role in international affairs.

I. INTRODUCTION

One of the by-products of the Gorbachev economic program appears to be a lessening of interest in large-scale resource projects and regional development efforts in Siberia. This particular aspect of the Gorbachev program has not been explicitly stated by Soviet spokesmen and, to that extent, may be somewhat speculative. Soviet economic plans continue to list various energy and resource projects in Siberia, and discussions of development strategy invariably allocate an important role to Siberia. However, a careful reading between the lines in the Soviet press suggests that the focus of economic development is no longer on Siberia, particularly not on its eastern regions facing the Pacific.

Several factors appear to have combined in producing such a reversal of attention compared with the Brezhnev era. For one thing,

* Editor, *Soviet Geography*. We note with sadness that Ted Shabad died on May 4, 1987, shortly after submitting this paper, one of his last contributions to the field.

Gorbachev's approach to economic growth, with its emphasis on intensification and modernization of existing industrial potential, inevitably allocates a key role to the western regions of the Soviet Union where most of the economic development has already occurred. For another, the expectations of an eastward orientation of Pacific Siberia, notably toward Japan, have not been fulfilled. The symbol of those expectations, the great new railroad known as the Baikal-Amur Mainline, remains incomplete, with virtually no development along its right of way.

The implications of this turn of events do not bode well for greater involvement of Siberia in the world economy, and may, in fact, signal an economic retrenchment of the Soviet Union as a whole.

II. HISTORICAL REVIEW OF SIBERIAN DEVELOPMENT

Before analyzing attitudes toward Siberian development under the Gorbachev administration, it may be useful to review the changing approaches to Siberia over time during the Soviet period. Interest in the development of this vast region, with its rich resource base but sparse population, has varied and has assumed different forms.

A. EASTWARD MOVEMENT UNDER STALIN

The early development of Siberia, starting with the first five-year plans in the late 1920's and in the 1930's, was motivated by a combination of factors—ideological, strategic, political. On the ideological level, Communist dogma associated uneven regional development with the capitalist system, maintaining that underdeveloped parts of the national territory such as Siberia can and should come into play under the conditions of a centralized, planned, Government-run economy. On the strategic plane, industrial locations far to the east within Siberia were viewed as inherently safer in case of war than the more vulnerable western locations close to the nation's European borders. And politically, it was considered important to industrialize once backward parts of the country with a view to demonstrating the economic evenhandedness of the new regime and thus gaining the allegiance of their inhabitants.¹

This early eastward movement was greatly accelerated during the emergency of World War II, when an effort was made to evacuate key industrial installations threatened by the German invasion of the Soviet Union in 1941. Both the prewar planning of eastern industrial locations and the wartime crash program of evacuation appear to have played a key role in providing an industrial base that sustained the Soviet war effort at a time when much of its industrial potential had been put out of action by military activity and enemy occupation.

After World War II, the focus on Siberian development waned as attention shifted to the reconstruction of the war-devastated economy in the western regions. And soon after this recovery had been achieved about 1950, Stalin died (in 1953) opening a new chapter in all aspects of Soviet development.

¹ For a detailed discussion of the early Siberian development approach, see: Theodore Shabad and Victor L. Mote, *Gateway to Siberian Resources*, New York: Wiley, 1977, pp. 1-61.

B. POST-STALIN POLICIES

It should be noted that much of the early eastward movement was achieved through tight controls on the disposition of labor, with strict regulation on the use of the regular work force and the availability of a vast reservoir of forced labor that could be maneuvered at will to foster development in environmentally harsh regions. After Stalin's death, most of the forced labor installations were disbanded and controls on the normal work force were relaxed, confronting the Soviet planners with the problem of attracting workers to Siberia with a variety of economic incentives.

Under the new conditions, Siberian development proved to be a far more complex and costly undertaking. Moreover, many of the old dogmas that had argued for Siberian development per se were no longer considered valid. Deep inland location of industry was no longer a guarantee of security in the new era of intercontinental ballistic missiles. The utopian idea of even regional development was no longer being accepted in face of the harsh environmental realities.

Soviet planners no longer aimed at integrated development of a Siberian economy, but came to regard Siberia increasingly as a storehouse of resources to be exploited for the benefit of the economically developed western regions of the USSR. Some of these resources, notably the oil and natural gas of West Siberia, but also the high-grade coal of the Kuznetsk Basin, assumed increasing significance as more accessible raw material sources in the western regions began to be depleted.

This general model of Siberian development, involving the westward movement of resources to the economically developed parts of the country, was modified in the early 1970's with the advent of détente and the decision to open up the eastern reaches of Siberia toward the Pacific basin through the construction of the 2,000-mile-long Baikal-Amur Mainline. As apparently envisaged, one of the functions of this rail project was to open up new resource sites along its right of way for export through Pacific ports.²

III. GORBACHEV'S ECONOMIC PRINCIPLES

A. THE CATCHWORDS OF THE GORBACHEV PROGRAM

The possibility that Soviet policy toward the development of Siberia might take another turn emerged soon after Mikhail S. Gorbachev assumed office in March 1985. The basic principles that were enunciated as guiding economic decisionmaking—intensification, scientific and technological progress, modernization of existing plant and equipment, resource-saving policies—all seemed to point in the direction of greater emphasis on the developed western regions of the Soviet Union, where most of the population and economic potential were concentrated.

Although it is difficult to be categorical in the absence of explicit policy pronouncements, the evidence suggests a shift away from

² The expectations embodied in this rationale are embodied in: Robert G. Jensen, Theodore Shabad and Arthur W. Wright, editors, *Soviet Natural Resources in the World Economy*. The University of Chicago Press, 1983, 700 pp.

ambitious Siberian regional development projects of the past and toward more effective use of the industrial capacity that is already in place, predominantly in the European part of the Soviet Union.

B. THE EFFECT ON SIBERIAN DEVELOPMENT

It goes without saying that any hypothesis of a turning away from Siberia must be considered in relative terms. The Soviet Union is not about to encourage a depopulation of Siberia or the abandonment of developed raw material and industrial sites. The region has already become established as an important, integral part of the Soviet economy, with 11 percent of the Soviet population and a contribution in fuels and electric power as well as industrial raw materials far in excess of its share of population.

Suffice it to say that Tyumen Oblast alone, with its vast oil and gas resources, now supplies nearly one-half of all the fossil fuels of the USSR. A number of mineral products, from diamonds to tin, from nickel and platinum-group metals to boron, come entirely or predominantly from Siberia. The region accounts for more than half the nation's aluminum production, drawn to the cheap electric power of the great hydroelectric dams of the Angara-Yenisei river basin.

What appears to be involved under the Gorbachev administration is a more subtle tendency—a hesitation to commit an ever increasing share of investment resources to development projects in remote, unpopulated regions with a harsh climate and other hostile environmental conditions. The argument presented here is difficult to quantify; it is largely a matter of qualitative judgment and perception.

Take, for example, the basic principles that appear to underlie the present economic policy. Efforts at intensification, meaning the achievement of greater return from existing industrial capacity, will evidently affect mainly the economically developed western regions where most of the manufacturing plant and equipment is already in place.

The intent to reduce new construction and to channel more investment into improving existing capacity is made clear in the 12th five-year plan (1986–90). "Material, financial and labor resources," it states, "are to be concentrated mainly on the retooling and rebuilding of existing plants."³

The plan also states that "the construction of new productive capacity is to be started only if the productive capacity of existing plants is being fully used."⁴ To be sure, the policy does not rule out the construction of new industrial establishments in undeveloped regions, but the emphasis in the plan is clearly on the developed regions. The point is made even more forcefully in the context of structural change in investment, where the share of funds going into reconstruction and modernization of existing industrial capacity is to increase to 50.5 percent by 1990, from 38.5 percent in 1985.⁵ The projected increase of 12 percentage points compares

³ *Pravda*, Mar. 9, 1986.

⁴ *Ibid.*

⁵ *Pravda*, June 19, 1986.

with a rise of 6 points during the preceding, 11th five-year plan (1981-85).⁶ The correlate of this trend would be a decline in new construction, much of which has been occurring in Siberia.

The enhanced emphasis on scientific and technical progress and on a greater role for the Soviet Union's research and development establishment is also bound to benefit mainly the western regions, where the centers of innovation are concentrated. Many of the new lines of industrial development—electronics, nuclear power, automation, the production of new types of materials—are associated with the older, developed regions rather than with Siberia.

Similarly the new priority given to the machine-building sector, with stress on more advanced machine tools, computer technology and robotics, is by its very nature a westward-looking strategy. The resource-saving policy, with its implications of recycling, the multi-purpose use of raw materials, substitution of synthetics for natural materials, and the greater use of scrap, is bound to have an impact on the opening up of new Siberian resource sites.

IV. DIFFERENTIATION WITHIN SIBERIA

The foregoing comments regarding a reorientation in general away from Siberia require qualification. It should be obvious that some Siberian resources, notably the oil and gas of West Siberia, will have to be developed by necessity. The same applies to the crucial coal deposits of the Kuznetsk Basin, which are likely to gain in significance as the Donets Basin, the principal producer of high-grade coal in the European USSR, declines. However, there seems little doubt that economic development in East Siberia and the Soviet Far East has begun to stagnate as the reorientation of the region toward the Pacific has failed to materialize.

A. CONTINUING IMPORTANCE OF WEST SIBERIAN RESOURCES

For purposes of the present discussion, a convenient divide in Siberia would be Lake Baikal, with the regions west of the lake being oriented largely toward the European part of the USSR, and the regions east of the lake being oriented toward the Pacific basin. The western portion of Siberia, thus defined, can be regarded as a virtual raw-material appendage of the economically developed European USSR.

1. *The oil and natural gas of West Siberia.*—These hydrocarbon resources of West Siberia, in particular, can be regarded as an extension of the western regions, with which the oil and gas fields are linked by a growing network of pipelines. West Siberian oil and gas are, of course, an essential component of Soviet economic development and a continuing major source of foreign trade revenues. Any comments regarding a lessening of interest in Siberian development under Gorbachev obviously do not apply to the oil and gas producing regions.

On the contrary, there is evidence of an intensive effort at development as older oil and gas producing regions decline and West Siberia becomes an increasingly important source of hydrocarbons. Notwithstanding the harsh natural environment, a major national

⁶ *Narodnoye khozyaystvo SSSR v 1985 godu*. Moscow: Finansy i statistika, 1986, p. 362.

development effort is now focused on this region.⁷ New towns are being built, and feeder railroads branching northward from the Trans-Siberian rail system in the south have been extended virtually to the Arctic coast. During the 12th five-year plan (1986-90), the focus in gas development is on the supergiant Yamburg field on the Taz Peninsula, north of the previously developed Urengoi field. And construction is already under way on a new rail line penetrating the Yamal Peninsula, in preparation for gas development there during the 13th five-year plan (1991-95).⁸

2. *The Kansk-Achinsk lignite and power project.*—In addition to the Kuznetsk Basin with its high-grade coking and bituminous steam coals, Soviet planners also appear determined to proceed with the development of the Kansk-Achinsk project, in which low-grade, though easily strip-mined lignite is to serve as the basis for electric power generation. These power stations are to be part of an ultra-high-voltage transmission system linking the hydroelectric stations of the Angara-Yenisei system westward through Kansk-Achinsk, the Kuznetsk Basin and the Ekibastuz coal basin of northeast Kazakhstan with the industrial region of the Urals.

Although the development of the Kansk-Achinsk lignite basin has been excruciatingly slow (energy planners having given priority to West Siberian gas development), there seems little doubt that Kansk-Achinsk will proceed after years of delay. The initial focus is on the Berezovskoye project at the new town of Chernenko, where a lignite strip mine with an ultimate capacity of 45 million tons a year is to supply a huge generating station with a designed capacity of 6,400 megawatts. The Berezovskoye project, having been carried over once again from its scheduled completion in 1986, is now planned to start up in 1987.⁹

B. STAGNANCY IN EAST SIBERIA AND THE FAR EAST

While selected projects, mainly in energy, continue to receive attention in the western part of Siberia, a curtain of silence appears to have descended over the eastern regions oriented toward the Pacific.

Here again there are exceptions in the form of metals projects, for example, that play a special role in the Soviet economy. An outstanding example is the continuing development of the unique mineral complex of Norilsk, near the Arctic Ocean, where the presence of rich deposits of nickel, copper, platinum-group metals and cobalt has stimulated year-round operation of the Northern Sea Route with the aid of nuclear and conventional icebreakers.

A development effort is also focused on the isolated tin lode mining and concentrator project of Deputatsky, in view of the generally tight supply of tin in the Soviet Union. The gold-mining districts of Magadan Oblast are also unlikely to be the object of lessening attention. By and large, however, one gets the impression that economic development to the east of Lake Baikal is no longer getting the priorities it had during the Brezhnev era. And the best

⁷ For details, see *Soviet Geography*, April 1987, "News Notes."

⁸ *Soviet Geography*, December 1986, "News Notes."

⁹ *Pravda*, Jan. 2, 1987.

indicator of these changing national priorities is the Baikal-Amur Mainline and its tributary region.

V. THE BAIKAL-AMUR MAINLINE AS AN INDICATOR

There has been a remarkable change in the attention this rail project and its economic development zone have received in the Soviet press, itself a useful barometer of priorities.

Once touted as the "project of the century" under the Brezhnev administration, the BAM, as it is commonly called, is seldom heard from these days. Ever since the rails along the entire 2,000-mile route were connected in 1984, work has continued on the construction of stations, towns, signals, marshaling yards and other auxiliary facilities. The longest tunnel, the North Muya, still remains to be completed, with a bypass rail route serving in the meantime.

Although the 12th five-year plan (1986-90) calls for completion of the entire system by 1990, one does not get the sense of purpose that characterized the BAM project during the Brezhnev era. Moreover, the five-year plan lists no mineral development projects along the new rail line even though the long lead times involved in these projects would justify an early start.

The lackadaisical pace at which work along the BAM continues is suggested by the report of a construction crew from Armenia, one of several from various republics that are contributing to the project.¹⁰ The crew from Armenia, which now numbers 105 workers, took nearly 10 years to do 9 million rubles worth of construction work on the settlement of Tayura and its rail station, Zvezdny, at the western end of the BAM, near Ust-Kut. It has now moved on to another settlement and rail station, Yanchukan, where it expects to do 13 million rubles' worth of work in five years. Over the last two years, since arriving at the Yanchukan site in 1984, the Armenian crew has assembled 23 homes, both prefabs and log cabins, as well as three dormitories for 180 people as well as a temporary boilerhouse, garage, concrete-mixing unit, storehouse and other auxiliary facilities. It has laid the foundations of prefab residential buildings with a total floor space of 9,870 square meters (accommodating about a hundred people) and of a shopping center, and started earthwork on the site of the Yanchukan rail station. The Armenian construction team is said to need 80 more workers, and is said to obtain its equipment and supplies from Yerevan, the Armenian capital, 7,200 kilometers away.

Perhaps the most revealing Soviet press report on the change of policy regarding the BAM zone appeared in *Izvestiya* on Dec. 26, 1986. According to this report, workers have begun to leave the Neryungri coal mine in southern Yakutia, which was developed as part of the BAM project. The mine reached its designed capacity of 13 million tons of coal in 1986, and the Coal Ministry has been re-assigning workers westward, to the Kuznetsk Basin and to the Kansk-Achinsk lignite and power project. The coal construction agency Yakutuglestroi, which built the Neryungri strip mine, is being virtually disbanded, with a thousand workers sent to the Kuznetsk Basin and 600 to the Kansk-Achinsk project. The Amur-

¹⁰ *Kommunist* (Yerevan), Dec. 20, 1986.

Yakutsk Mainline (AYaM), which is supposed to be built over the next 10 years from the BAM northward to Yakutsk, has come to a virtual standstill because of lack of financing, and the development of a major mineral project in the area, the Seligdar apatite deposit, though listed in the five-year plan, is now in doubt.

VI. IMPLICATIONS FOR THE ROLE OF SIBERIA IN THE WORLD ECONOMY

The apparent retrenchment in Siberian development comes at a time when Soviet foreign trade revenues from exports of oil and natural gas have been declining because of a drop in world prices. It was long thought that the USSR might benefit from a diversification of its exports through the development of other mineral raw materials. However, the lack of any plans for mineral development in the BAM zone does not appear to bear out such forecasts. The reduction of foreign exchange from energy exports, in turn, may result in a decline of imports from the West, and generally a reduced participation of the USSR in world trade. Such an outcome would also be in keeping with efforts to upgrade the Soviet Union's machine-building sector and its emphasis on high tech development, thus reducing dependence on imports from the West.

Another factor to be considered is the dim outlook for more trade between the Soviet Union and Japan, which had long been regarded as a potential market for Siberian raw materials. However, as Leslie Dienes has pointed out,¹¹ the course of economic development in Japan has become increasingly out of step with the economic evolution in the USSR. The post-industrial phase of Japanese economic growth, with its emphasis on high tech, electronics, computers, and so forth, does not require large raw-material inputs that might have come from the USSR, especially Siberia.

In view of the cyclical trends of the past, Soviet interest in Siberia may well be revived at some future point. But for the time being, it would appear that a variety of factors combine to refocus Soviet interest on further development of the densely populated, economically equipped western regions of the country rather than on the vast undeveloped reaches of the east.

¹¹ Leslie Dienes, "Soviet-Japanese economic relations: Are they beginning to fade?" *Soviet Geography*, September 1985, pp. 509-526.

REGIONAL PLANNING: THE BAM AND THE PYRAMIDS OF POWER

By Victor L. Mote*

CONTENTS

	Page
Summary	365
I. Introduction.....	367
II. The BAM in the perspective of the Soviet economy	369
III. The BAM plan	372
IV. The BAM in the twelfth five-year plan (1986-90).....	377
V. What's missing and why?	378
VI. Conclusions: The future of BAM.....	380

FIGURES

1. The BAM and its service area.....	366
2. The BAM regional development program: Table of organization	375

SUMMARY

Two of the hallmarks of communist ideology are civil and spatial equality. Without one there cannot be the other. In the utopian sense of true communism, human beings share equally in all resources, and all regions of the country advance equally with all others. As a condition that is one of "transition" to communism, socialism theoretically can, and does, have a certain measure of inequality, but should never lose sight of the aspiration. In this respect, the ideal plan for spatial organization is "planned proportional development," whereby no area of the country lags behind any other economically.

Although obviously a pipe dream, planned proportional development subtly lurks in the shadows of Soviet regional planning and, on occasion, becomes more or less important depending upon the administration in power. In light of his approach to the development of new frontiers of Siberia, Leonid Brezhnev evidently considered the ideal policy as costly but necessary. He invested heavily in assets that would have little immediate return in anticipation of long-term future benefits. One of these assets was the Baykal-Amur Mainline (BAM) Railroad in the southern tier of East Siberia and the Soviet Far East (figure 1).

*Associate Professor of Geography and Russian Studies, University of Houston, University Park Campus.

Now Mikhail Gorbachev has arrived on the scene with what can only be described as an intensive approach to the Soviet economy. Some claim that, in so doing, he has repudiated many of Brezhnev's Siberian development projects. This study indicates that, although Gorbachev himself may view his policies as a temporary retreat in order to renovate industry in the western parts of the country, the long-term plans for BAM and other projects may very well be right on target. Moreover, with Abel Aganbegyan as his chief economic adviser, Gorbachev may be ready to lower the boom on departmentalism in regional planning.

I. INTRODUCTION

Regional planning in the Soviet Union dates at least from Lenin's State Plan for the Electrification of Russia (GOELRO), approved by the Eighth All-Russian Congress of Soviets in December 1920.¹ The practice was integrated into the first five-year plans and continues to play an important role in the economy. Theoretically and logically, regional planning should form the very hypostasis of a centrally directed economy, for phenomena cannot occur in time unless they also occur in space. Whereas in the West "the region" is viewed as a gestalt intellectual concept or pedagogical tool of convenience, in the Soviet Union it is perceived as "objective reality" with clearly defineable limits and traits.² Accordingly, the theoretical literature associated with regional planning and regional geography in the USSR easily ranks among the richest in the world with at least sixty years of history.

Ironically, the gap between the theory of Soviet regional planning and the reality of its implementation is as wide as it would be expected to be in many Western countries. Down through the years, Soviet planners have logged in literally billions of man-hours of laboratory time, which for the last two decades have been computer assisted. Sophisticated, comprehensive "program plans" for various parts of the country have been developed and submitted to the ministries for practical application.³ Unfortunately, many of the visionary ideals of science get lost in the shuffle of red tape inside the bureaucracy, in the end becoming mere ectypes of ministerial/sectoral caprice ("departmentalism"). In a courageously written chapter published through Novosibirsk's vanguard Institute of Economics and Organization of Industrial Production (IEOPP), R. I. Shniper, a close associate of Academician A. G. Aganbegyan, noted that if comprehensive planning is ever to become reality, its "participants must be free from the confines of narrow-minded sectorialism and, likewise, free from decisions prejudiced by short-range ministerial interests."⁴ As Shniper emphasizes, regional program-

¹ Institut Marksizma-Leninizma pri TsK KPSS, *Lenin, Istoriko-biograficheskiy atlas*. Moscow: GUGK pri SM SSSR, 1983, pp. 6, 50.

² N. D. Pistun, ed., *Ekonomicheskaya geografiya SSSR, Rayonnaya chast'*. Kiev: Vishcha shkola, 1984, p. 4.

³ A. S. Novoselov, "Modelirovaniye krupnykh territorial'nykh program," in ed. A. G. Aganbegyan and R. I. Shniper, *Metodlogicheskiye polozheniya razrabotki krupnykh territorial'nykh program*. Novosibirsk: Nauka, 1986, p. 110.

⁴ R. I. Shniper, "Programmnaya prarabotka problemy khozyaystvennogo osvoyeniya zony BAM," in ed. A. G. Aganbegyan and A. A. Kin, *BAM: Pervoye desyatiletie*. Novosibirsk: Nauka, 1984, p. 74.

oriented plans are interministerial in character and require a new approach to the acceptance of decisions and solutions.

In a previous report to Congress, David Kamerling explained that the goal of Soviet regional planning has been to equalize regional levels of living and development and to exploit all resources.⁵ Large-scale regional crash development programs have been endemic to all the five-year plans ever since the 1920s: the Ural-Kuznetsk Combine, wartime redeployment, the Virgin Lands, the West Siberian Energy Complex, inter alia have required huge financial investments, human sacrifice, not to mention effective communication between and among ministries. Unfortunately, sectoral planning by ministries has become so calcified during the Soviet period that "effective communication" is the exception rather than the rule, and truly comprehensive regional planning has been neglected. Many Soviet ministries have become petty fiefdoms that are hardly representative of socialist emulation.

As Kamerling further confirmed, the ministries have been attacked to little avail since the Khrushchev years, when by means of a short-lived decentralization reform (the *sovnarkhoz* reform), sectoral departmentalism merely metastasized to the regional level. Since 1971, attempts to decentralize the ministries have been conducted in subtler ways: each of the last four five-year plans have included increasingly louder calls for "unity among sectoral, territorial, and program planning" agencies, comprehensive planning, and carefully cultivated intercommunications, especially, in prototypes of regional planning called territorial-production complexes (TPCs).⁶

General Secretary Gorbachev seems to prefer these forward-looking approaches to the traditional forms of economic planning, and in the middle of 1985, he summoned to Moscow the country's greatest advocate of the "program-oriented approach" to regional planning, Academician Abel G. Aganbegyan. Aganbegyan had been the Director of IEOPP since 1967 and, in that position, had been responsible for some of the most sophisticated research on regional development in the history of the USSR; moreover, he was in charge of the innovation of comprehensive plans for the organization and development of Siberia as a whole, including one of the biggest challenges of his lifetime, the Baykal-Amur Mainline (BAM) railroad and its tributary area. As the Chief Editor of the journal *EKO* published by the Siberian Department of the Soviet Academy of Sciences, Aganbegyan had the opportunity not only to publish many of his own works but also to serve as editor or coauthor of dozens of books and articles on the construction and regional development of the BAM. Today Aganbegyan is reputed to be Gorbachev's closest economic adviser.⁷

⁵ D. S. Kamerling, "The Role of Territorial Production Complexes in Soviet Economic Policy," in U.S. Joint Economic Committee, Congress of the United States, *Soviet Economy in the 1980s: Problems and Prospects. Part 1*. Washington, D.C.: U.S. Government Printing Office, 1983, pp. 245-247.

⁶ SSSR, KPSS, *Materialy XXVII s'yezda Kommunisticheskoy partii Sovetskogo Soyuz*. Moscow: Politizdat, 1986, pp. 330-331.

⁷ A. G. Rahr, *A Biographic Directory of 100 Leading Soviet Officials. 3rd Edition*. Munich: Radio Liberty Research, 1986, p. 6. Along with the previously cited anthologies, Aganbegyan coedited *Sistema modely narodnokhozyaystvennogo planirovaniya*. Moscow: Mysl', 1972; *Sibir' v ye-*

II. THE BAM IN THE PERSPECTIVE OF THE SOVIET ECONOMY

The Russians first considered building a railway that would skirt the northern extremity of Lake Baykal in the 1880s.⁸ Years earlier, there were similar proposals for mainlines by which Europe and the Far East could be connected via the Russian heartland, but none was taken seriously. In 1888, a northern route for the proposed Trans-Siberian that would be shorter by 500 km (300 mi) than the eventually approved southern route was urged by a committee of experts. However, the severity of the climate and relief of the northern option ultimately proved to be too much for the railway construction technology of the nineteenth century.

Although precedent for the BAM can be found in the pre-revolutionary period, the earliest practical designs originated in the Soviet period (1924).⁹ The Little BAM, running north between BAM Station and Tyndinskaya (today's Tynda), was first built between 1933 and 1937, only to be dismantled during the war and relaid between 1972 and 1979. The first survey of the BAM route was completed by the end of 1944, and the Pivan' (on the east side of the Amur opposite Komsomol'sk)-Sovetskaya Gavan' eastern terminus went into full operations in 1945. In the immediate postwar period, the western terminus of BAM (Tayshet-Lena) was given highest priority, and by 1950, the line was in partial service; by 1965, the same line was electrified. With the addition of a 209-km (130-mi) logging railroad from Komsomol'sk to Berezovka (Postyshevo) in the 1950s, some 3,115 km (1,935 mi) separated the projected BAM from reality. Track-laying was finally completed between 1974 and 1984.

THE BREZHNEV APPROACH: 1964-1982

Although it gave a credible amount of lip-service to an "intensive development policy" late in its tenure, Brezhnev's administration was characterized by growth policies that, in retrospect, can be called "extensive."¹⁰ Such policies include massive investments in new projects over old ones, heavy reliance on traditional technologies and labor policies, an adventuristic foreign policy, a considerable waste of energy and resources, and the opening of new frontiers. The overextension that resulted from these ill-fated policies encouraged an economic slowdown that involved a drop in the annual growth of Soviet GNP from a peak in 1964 of about 11 percent to 2 percent or less by 1980.¹¹ The emphasis on the construction of new factories led to massive superannuation of structures and equipment in the European USSR, some of which had not been

dinom narodnokhozyaystvennom komplekse. Novosibirsk: Nauka, 1980; and *BAM stroitel'stvo. Khozyaystvennogo osvayeniye.* Moscow: Ekonomika, 1984. Between 1974 and 1983, he also published some twenty articles on the BAM.

⁸ SSSR, Akademiya Nauk, Kommissiya po problemam Sereva, *Letopis' Severa*. Vol. 2. Moscow: Geografiz, 1957.

⁹ A. A. Kin and L.A. Semina, "BAM: Fakty, sobytiya, kommentarii," in ed. A. G. Aganbegyan and A. A. Kin, *BAM: pervoye desyatiletie*. Novosibirsk: Nauka, 1984, p. 171.

¹⁰ M. Elizabeth Denton, "Soviet Perceptions of Economic Prospects," in U.S. Joint Economic Committee, Congress of the United States, *Soviet Economy in the 1980's: Problems and Prospects. Part. 1*. Washington, D.C.: U.S. Government Printing Office, 1983, p. 30.

¹¹ Richard F. Kaufman, "Is NATO Still the Centerpiece of U.S. Foreign Policy? Should It Be?" Testimony before the European Subcommittee of the Senate Foreign Relations Committee, September 12, 1985 (Mimeographed).

renovated since the 1920s. Increasingly low increments joining the labor pool necessitated greater reliance on automation and modern technology, but, under Brezhnev, Soviet R&D in this area was not up to the challenge. Militarization and involvement in foreign "wars of liberation," culminating in the invasion of Afghanistan, squeezed the Soviet budget to record weakness, and the waste of energy and resources was nonpareil.

In this regard, if all the metal lost in the Brezhnev economy of 1982 could have been recovered, it would have saved 50 million tons of steel, 65 million tons of coke, and 100 million tons of iron ore. The country's metal industries recycled half of their scrap iron and steel, a third of their copper, and a miserly percentage of their aluminum. Although invented by Soviet engineers, "continuous cast" steel technology was used in only 12 percent of Soviet steel mills. In contrast, Japanese plants, which had borrowed the technology from the USSR, produced more than half of their steel by continuous casting. In microcosm, a Soviet citizen wasted 1.5 times more hot water than the world average; water was unmetered and essentially free. The lack of utility meters throughout the economy resulted in a yearly loss of 80 million units of standardized fuel equivalents.¹²

Perhaps the cornerstones of the Brezhnev legacy, however, were the crash programs aimed at developing new resources and frontiers, among which were the West Siberian oil and gas development projects, accelerated undertakings in the Ekibastuz and Kansk-Achinsk coal basins, the non-Chernozem project, and, of course, the BAM. With the exception of the 40-billion-ruble non-Chernozem project, all of these developments were thousands of miles away from the principal consumers and, consequently, were extremely costly. The West Siberian oil and gas projects are estimated to cost 10 billion rubles per year at present, and the BAM to date has cost no less than 20 billion rubles overall.¹³

THE GORBACHEV APPROACH—SOVIET PRIORITIES IN THE LATE 1980S: DOES BAM FIT IN?

When he ascended to power in March 1985, Gorbachev promised a return to fiscal responsibility. He installed proven managerial talents in the country's highest offices and reinforced Andropov's call for discipline in the workplace. He has shown little tolerance for bureaucratic inertia. In turn, he has sharply criticized the economic policies of Brezhnev. The hallmarks of Gorbachev's approach stress "intensive growth," involving (1) more effective use of existing plants and equipment, (2) increased reliance on scientific research and development, (3) modernization, and (4) the reduction of waste in industry.

If successfully implemented, these guidelines should reestablish the European USSR as the primary beneficiary of investment. For example, during the twelfth five-year plan (1986-90) investments in

¹² *Izvestiya*, November 15, 1981 and February 16, 1982.

¹³ This is two-thirds of the "short-range (to 1995)" capital investment in BAM. Of the third (10 billion rubles) remaining, half is earmarked for residential needs, 38 percent for the construction of new industries, and 12 percent for other purposes. *Pravda*, September 7, 1985 and *Gudok*, February 15, 1986.

existing factories and plants will rise from 38.5 percent of the 1985 budget to 50 percent in 1990.¹⁴

Exactly where this leaves BAM is unclear at the moment, but the implications would seem to be negative. Under Brezhnev, investments in Siberia and the Far East, including the BAM and its service area, grew from 15.2 percent in 1966 to 18 percent in 1980.¹⁵ As the Siberian projects were implemented, factories, machinery, and equipment in the European USSR deteriorated. In Gorbachev's own words, the pet schemes of bureaucrats (under Brezhnev) "put the brakes on transfusions of capital investments and resources into the most promising industries. The gross approach to economic analysis twisted the true situation of things and yielded devious signals. . . ."¹⁶ This "misguided investment policy" directed money away from growth industries (especially tool and die, instrumentation, and computers) into long range, extensive development projects with little promise of immediate returns on the investment.

As the BAM was built, both domestic and international marketing potentials and priorities changed. In part an indirect offshoot of the OPEC oil embargo and the worldwide shortages of resources that characterized the 1970s, the BAM regional development program faces a different world in the 1980s than it did in the 1970s. Moreover, other intervening resource opportunities have arisen that obviate some, but not all, of BAM's potential. The share of West Siberian oil reserves and output that were to be carried by the BAM have declined since 1983, and even if they had increased, they would have had to cope with an international oil glut. A worldwide copper surplus reduced enthusiasm for the giant, geologically complex, copper sands at Udokan, and even if the glut did not exist, Udokan would face stiff competition from the copper imports now coming in from Erdenet in Mongolia and potential imports of copper from Aynak in Afghanistan. Whereas Udokan's infrastructure has not yet seen the light of day, Erdenet's is well established, and, though yet undeveloped, Aynak is a far closer opportunity than the other two sites. The highly promising asbestos lode at Molodezhnyy is faced with an international movement to ban asbestos processing altogether because of the mineral's carcinogenic property. Gorbachev surely is aware of these facts and, as an economic conservative, he has had to deal with them rationally.

Even if the resource picture were rosier, the General Secretary would have to shuffle investments in light of the grave catastrophes that occurred during the mid-1980s at the Severomorsk naval base on the Barents Sea and at the Chernobyl' atomic power station in the Ukraine. All but forgotten in the wake of Chernobyl', the explosion at Severomorsk in 1984 put the naval base out of commission for two years, 200 lives were lost, two-thirds of the

¹⁴ *Gudok*, June 19, 1986.

¹⁵ Leslie Dienes, "The Development of Siberia. Regional Priorities and Economic Strategy," in ed. George J. Demko and Roland J. Fuchs, *Geographical Studies on the Soviet Union*. Chicago: University of Chicago, Department of Geography, 1984, p. 191 and A. B. Smith, "Soviet Dependence on Siberian Resource Development," in U.S. Joint Economic Committee, Congress of the United States, *Soviet Economy in a New Perspective*. Washington, DC: U.S. Government Printing Office, 1976, p. 483.

¹⁶ *Gudok*, June 17, 1986.

base's surface-to-air missiles were destroyed, three-fourths of the surface-to-surface long-range missiles were eliminated, the SAM stock was damaged, and the complete stock of SS-N-22 missiles and some SS-N-19 missiles were ruined.¹⁷ The disaster easily cost billions despite the fact that no cost figures have been made public. Chernobyl', for example, caused the death of 30 people with direct losses calculated at 2 billion rubles as of the fall of 1986, and these are only the immediate losses.¹⁸ The cost of the damages incurred at Severomorsk and Chernobyl' together no doubt could have paid for the track-laying on the BAM railroad between 1974 and 1984 (estimated 4 billion rubles). When these expenses are augmented by the estimated 20-billion-ruble outlay for the war in Afghanistan (between 1979 and 1986),¹⁹ it is easy to see why Gorbachev may seek at least temporary shifts in investment priorities.

Given the state of his economy, Gorbachev could hardly feel generous toward such long-range projects as the BAM and Amur-Yakutsk Mainline (AYAM) railway development projects. In fact, not once during his now-famous speech "For Peace, Security, and Cooperation in Asia and the Pacific" given in Vladivostok on July 28, 1986—in fact, not once in his nearly week-long visit to the Far East—did he mention BAM or AYAM publicly.²⁰ This contrasted sharply with the fanfare given the projects when Brezhnev visited the same regions in the late seventies. Gorbachev did, however, broach the subject of a special plan for the Soviet Far East to be issued at some later date. One gets the impression that the "special plan" will emphasize coastal development in lieu of interior (BAM, AYAM) development.^{21a}

III. THE BAM PLAN

Between 1974 and the fall of 1983, almost 10,000 books, pamphlets, journal and magazine articles, and newspaper reports dealing with the BAM and its construction project appeared in the Soviet Union. These were carefully documented in the reference journal *Problemy BAM* published by the State Public Science Library of the Siberian Division of the Soviet Academy of Sciences in Novosibirsk.^{21b} Well over half of the citations dealt with subjects that could be construed as literature on regional planning. This was especially true of the publications of Aganbegyan's IEOPP.

The BAM service area regional development project is the first and, to date, the most ambitious example of program-oriented planning to be formulated in the USSR. It was designed to coordinate the expansion of the economy, living standards, and ecology of a

¹⁷ *The Houston Post*, July 11, 1984.

¹⁸ *The Christian Science Monitor*, August 20, 1986.

¹⁹ Bhabani Sen Gupta, *Afghanistan: Politics, Economics, and Society*. Boulder, Colorado: Lynne Rienner Publishers, Inc., 1985, pp. 106-107.

²⁰ *Gudok*, all issues between July 27 and August 1, 1986. The special program for the "comprehensive development of the productive forces of the Soviet Far East to the year 2000" was outlined briefly to the Politburo on August 16, 1986 (*Gudok*, August 17, 1986). It was first broached by Gorbachev in Komsomol'sk-na-Amure on July 30, 1986.

^{21a} See postscript at end of paper.

^{21b} An SSSR SO, Gosudarstvennaya publichnaya nauchno-tehnicheskaya biblioteka, *Problemy BAM*. Novosibirsk: Nauka, published quarterly between 1975 and 1983. In 1976, the reference was entitled *Baykalo-Amurskaya magistral' i problemy khozyaystvennogo osveniia novoy zony*. I am exceedingly grateful to Patricia Polansky, Russian bibliographer at the University of Hawaii at Manoa, for apprising me of this reference: its total circulation is a mere 500 per issue.

region that is roughly the size of Alaska (1.5 million sq km). Since 1974, the population of the zone between Ust'-Kut and Komso-mol'sk has skyrocketed from around 10,000 to over 600,000 primarily clustered in cities, towns, and urban settlements strung out along the mainline of the new railroad. Siberian scholars recognized, virtually from the outset, that such explosive growth in an area with a surprisingly sensitive environment demanded a new farsighted approach to regional planning.²²

"Program-oriented planning" (*programmno-tselevoye planirovaniye*) is a Soviet version of long range, comprehensive, multi-purpose planning, involving a holistic, quasi-montage organization of a given landscape. Before 1975, planning for the BAM project focused chiefly on geological surveys by Siberian-based earth scientists and on field work devoted to designing the route of the railroad by specialists based in Moscow (*Mosgiprotrans*).²³ Since 1975, both theoretical and applied planning have been coordinated by the Scientific Council on BAM Problems, headed by Aganbegyan and including an interdisciplinary team of 50 leading scientists and specialists working both in Moscow and in Siberia and the Far East. The council reconciles the work of more than 180 scientific subgroups of the Soviet Academy of Sciences (45), the Academy of Medical Sciences (50), the Siberian Division of the Soviet Academy of Agricultural Sciences (VASKHNIL) (25), and more than 50 scientific subgroups of different ministries and agencies.²⁴ Since the council's inception, standing research groups have diligently studied the problems and prospects of railway construction, strategies, stages, and the sequence of BAM zone economic development, the economic efficiencies and priorities of resource exploitation, human resources and problems (food supply, adaptation to extreme environments, and so forth), and environmental protection. The results of this research have been discussed in detail at the semiannual meetings of the council and at a half-dozen all-union scientific conferences.

The council meetings are held in different locations within the BAM service area. Past discussions have centered on the development of the South Yakutian TPC, the development of the productive capacities of the western and eastern wings of the service area, the Udokan industrial node, the creation of industries producing commodities for export (basic industries) in connection with the construction of the BAM, and so on. By holding their meetings *in situ*, council members have become thoroughly acquainted with the service area. The on-site gatherings also permit the active participation of local party organs, planning authorities, academics and scientists, and economic councils, thus enabling quasi-grassroots input to enter the planning process.

²² K. P. Kosmachev, *Pionernoye osvoeniye taygi*. Novosibirsk: Nauka, 1974; Yu. A. Bukreyev and Ye. N. Pertsik, "Problemy general'noy skhemy rayonnoy planirovki zony vliyaniya Baykalo-Amurskoy magistrali," *Opyt razrabotki i realizatsii skhem i proyektov rayonnoy planirovki*, Vol. 7 (1976), pp. 20-24; Ye. N. Pertsik, "Voprosy rayonnoy planirovki zony BAMa," in ed. I. V. Kozlov, et al., *Baykalo-Amurskaya magistral'*. Moscow: Mysl', 1977, pp. 181-193.

²³ Various interviews with A. G. Aganbegyan (Novosibirsk), Yu. P. Mikhaylov (Irkutsk), K. P. Kosmachev (Irkutsk), V. N. Posudnevskiy (of *Mosgiprotrans* in Berkakit), and M. T. Morozov (Neryungri) during March 1985.

²⁴ N. M. Singur, "Tselevaya programma razvitiya zony BAM," in ed. A. G. Aganbegyan and A. A. Kin, *BAM: pervoye desyatiletie*. Novosibirsk: Nauka, 1984, pp. 108-109.

At IEOPP, the council's practical data are programmed into an economic-mathematical model called *BAMkontrol*, within which the relationships of construction time intervals and development priorities are harmonized with requests for sequential capital investments. Based on the computerized output, the council devises its regional plans, which at this stage are no more than recommendations.

The recommendations are forwarded to GOSPLAN USSR by way of GOSPLAN RSFSR. As "principal executor" of the BAM program, GOSPLAN RSFSR, in consultation with the Scientific Council and the ministries and agencies of GOSPLAN USSR, drafts plans for the comprehensive development of BAM. So far, it has devised a BAM program plan to the year 1990 with tentative targets to the year 2000 in accordance with the five-year plan sequence. Overall coordination of BAM program development is vested in the BAM Coordinating Council under the leadership of the first deputy chairman of GOSPLAN USSR (figure 2). The coordinating council was created to develop the guidelines for economic and social development within the BAM service area and to incorporate those guidelines into five-year plan proposals. In compiling its guidelines, the coordinating council relies on the efforts of dozens of ministries, agencies, and academic research and design institutes indirectly assisted by the work of the Scientific Council on BAM Problems.

The BAM Regional Development Program:
Table of Organization

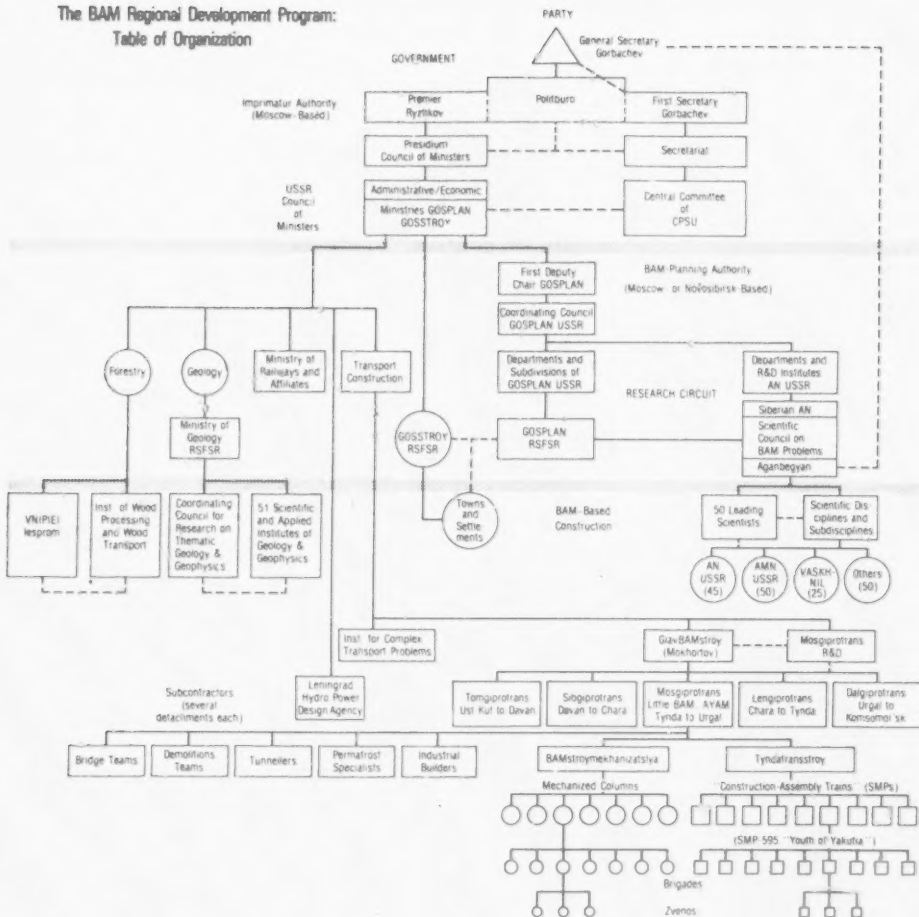


FIGURE 2. In Mote, "Regional Planning: The BAM and the Pyramids of Power"—A rough approximation of the table of organization of the Baykal-Amur Mainline Railroad regional development project. (The broken lines indicate overlapping authorities.) The organization resembles a "triple-layer cake," including an approval (imprimatur) level in Moscow, a planning level specifically for the BAM program in Moscow (e. g., SOPS) or in Novosibirsk (the Scientific Council of IEOPP), and a construction/development level always on site in the BAM service area. Note the verticality (solid lines) and the lack of liaison.

Sources include Denis J. B. Shaw, "Spatial Dimensions in Soviet Central Planning," *Transactions of the Institute of British Geographers*, Vol. 10 (1985), p. 405; N. M. Singur, "Tselevaya programma razvitiya zony BAM," in ed. A. G. Aganbegyan and A. A. Kin, *BAM: pervoye desyatiletie*. Novosibirsk: Nauka, 1984, esp. pp. 108-109; Paul Gregory and Robert C. Stuart, *Soviet Economic Structure and Performance*. Second Edition. New York: Harper and Row Publishers, 1981, pp. 118-119; and Victor L. Mote, "A Visit to the Baikal-Amur Mainline and the New Amur-Yakutsk Rail Project," *Soviet Geography*, Vol. 26, No. 9 (November 1985), pp. 691-716.

Herein lies the weakest link in the imprimatur chain. Using the methodology proposed in a GOSPLAN USSR resolution of January 31, 1980 ("Methodological Guidelines for the Development of Comprehensive Program Approaches to Solving Regional Problems and the Formation and Development of TPCs"), GOSPLAN RSFSR,

after consultation with the Scientific Council, passed its own resolution on "The Methodology of Developing a Comprehensive Program Approach to the Development of the BAM Zone for Establishing Program Timeframes up to the Year 2000" (April 18, 1983).²⁵ This plan was submitted for inclusion in the twelfth five-year plan by GOSPLAN USSR and the Andropov-led Politburo. The resolution not only defined the planned targets for the BAM but the duties of each of the ministries and other applied-program participants. As of late 1984, the program had not been approved.

Among other things, the comprehensive program plan for the BAM service area envisions a system of regionally distinctive TPCs and industrial nodes. As noted by Kamerling and others, a TPC is a mechanism for spatial organization that optimizes the use of a given area's human and physical resources for a desired economic effect. Industries within TPCs are in theory jointly responsible for local investment in production and infrastructure (territorial planning). TPCs contain their own nationally significant (basic) industries, auxiliary industries in direct support of the basic industries, and industries of only local support (non-basic service industries).²⁶ Territorial planning runs counter to traditional sectoral planning by individual ministries; however, experts claim the method can save up to 20 percent of the capital investment costs now expended under sectoral plans. Economists, logically, strongly favor TPCs whereas the ministries resist them.

The TPC concept has been found to be an especially effective way to organize the territory of a newly industrializing region like the BAM. Through the years, various networks of TPCs have been proposed for the BAM service area. As of 1985, planners appear to have settled on a system of six TPCs and five industrial nodes, including: as TPCs (1) South Yakutia, (2) Upper Lena, (3) North Baykal, (4) Mama-Bodaybo, (5) Selemdzha, (6) Komsomolsk-na-Amure; and as industrial nodes (1) Udokan, (2) Tynda, (3) Zeya, (4) Urgal, (5) Sovetskaya Gavan'.²⁷ The interlocking TPCs and nodes ultimately are to be enmeshed in an overall BAM economic region. As Kamerling wrote earlier, the extent to which these territorial units will hold sway in future Siberian planning is yet to be determined.

What is understood is that the BAM program is designed as a multi-stadial thirty-year plan. The first stage (1985-95) includes (1) upgrading the railroad to "fully operational" status, (2) the creation of a reliable construction industry within the service area, (3) the continuation of detailed geological surveys, prioritizing their order of development, (4) determining what constitutes BAM zone basic industries and their sites, (5) devising the optimum distribution, networking, and production by TPCs and industrial nodes, (6) the development of the South Yakutian TPC and laying the

²⁵ *Ibid.*, p. 112.

²⁶ For an excellent summary of the TPC concept in English, see Kamerling, "The Role of Territorial-Production Complexes," pp. 242-266, footnote 5. See as well, M. K. Bandman, N. I. Larina, M. Yu. Cherevikina, et al., eds., *Territorial'no-proizvodstvennyye komplekсы: planirovaniye i upravleniye*. Novosibirsk: Nauka, 1984 and L. I. Vinokurova, "Metodika izucheniya territorial'no-proizvodstvennykh kompleksov," *Geografiya v shkole*, No. 3 (May-June 1978), pp. 30-36.

²⁷ Singur, "Tselevaya programma," pp. 120-122, footnote 24.

groundwork for the formation of the North Baykal TPC, and (7) completion of the network infrastructure.

The second stage (1995–2005) is characterized by the expansion of the number of resources to be exploited by the region's basic industries. If 30 to 40 percent of the capital investments in BAM are earmarked for resource development during the first stage, then in the second stage the figure is more than likely to be 75 percent. Thus, virtually all of the TPCs and industrial nodes envisioned for the service area will be under construction during this phase of program implementation. (Completion of the AYAM will occur during this stage as well.)

The third stage (2005–2015) will see full completion of the BAM's network of TPCs and industrial nodes. With a fully operational AYAM, the objectives now shift in the direction of the northeast, with regional planners concentrating their energies on comprehensive program approaches for the development of that area. In other words, the BAM program is like a trunk or a springboard for the future development of Siberia's most forbidding reaches, to which branches eventually will extend well into the twenty-first century (the "tree of goals" concept).

IV. BAM IN THE TWELFTH FIVE-YEAR PLAN

American observers like Theodore Shabad and Leslie Dienes have keenly noted the conspicuous absence of guidelines for the BAM service area within the resolutions of the twelfth five-year plan. Shabad has suggested that this is one of several manifestations of Gorbachev's subtle reluctance to continue to invest in Siberia in the manner of Brezhnev.²⁸ Shabad and others have suggested that springboard projects like BAM and AYAM are, if not deceased, then quite unwell.

Indeed, the current plan is very succinct when it comes to BAM. It demands—

1. the introduction of full operations over the entire length of the BAM railway that will set in motion the large-scale economic development of the service area;
2. continue to develop the South Yakutian TPC;
3. start up the second unit of the Neryungri state regional power plant;
4. begin construction on the Seligdar apatite processing plant;
5. complete the groundwork on the creation of a ferrous metallurgical base in the Far East that will utilize local coking coal and iron ore;
6. extend the construction of the railroad from Berkakit to Tommot to Yakutsk (Amur-Yakutsk Mainline or AYAM);
7. lay a natural gas pipeline from Okha to Komsomol'sk-na-Amure;
8. introduce the first turbine unit of the Bureya hydropower station.²⁹

²⁸ Theodore Shabad, "The Gorbachev Economic Policy: Is the USSR Turning Away from Siberian Development," a paper presented at the Conference on the Development of Siberia: Peoples and Human Resources, London, April 1986 (Photocopied); see his chapter in this volume as well.

²⁹ SSSR, KPSS, *Materialy XXVII s'yezda KPSS*, p. 320, footnote 6.

At the end of 1985 only one-third of the BAM was fully operational. Of the remaining 2,000 km, three-quarters of the track was suitable for partial service, with the rest used by work trains. Only one of eight major tunnels along the route was fully operational (the North Muya was half finished and at least five years from completion), over vast spans of mainline the subgrades and foundations were still too unstable for all but slow-speed traffic, stations and depots needed upgrading, repair shops were yet too few, and electrified spans were behind schedule. All of these criteria needed to be met before the BAM could be upgraded to high-speed, fully operational status. The intention of the first objective, therefore, is to lay the basis for further development of the service area through the effective use of the railroad itself. This is not inconsistent with the long-range plan of IEOPP and GOSPLAN RSFSR, both of which require that the BAM must be fully operational *before* balanced development can occur.

The rest of the plan is sparse indeed. Objectives 2 through 6 relate directly to the creation of the South Yakutian TPC. There is no mention of North Baykal, which was an integral part of the IEOPP recommendation, and, although it is candidly in the plan, as of 1986, AYAM was guaranteed only 15 percent of the investment required in order to meet its original target (Tommot).³⁰

The gas pipeline to Komsomol'sk is virtually finished, and a new minimill processing scrap steel into continuous-cast specialty products has gone on stream in the city. Thus, Komsomol'sk, which qualified as a TPC *before* the BAM was built, and South Yakutia represent the only real manifestations of the BAM regional development program. Clearly, there is a basis for Shabad's argument.

However, BAM programmers have clearly indicated that between now and 1995 the main objectives rest with developing the infrastructure of the railway zone. That, in fact, is explicit in the plan. Irrespective of his many other duties, Aganbegyan is no doubt present in Moscow to syncretize IEOPP's thirty-year program-oriented approach with sectoral planning, as well as to streamline the management of those plans.

V. WHAT'S MISSING AND WHY?

The most obvious casualty of Gorbachev's hard-line approach to Siberian development projects is the Udokan copper deposit, which was slated for R&D during the eleventh five-year plan (1980-85).³¹ In potential value, Udokan easily ranks as the second most important resource development site in the BAM zone. With prognosticated reserves of 1.2 billion tons of copper ore with an average metal content of 2 percent (24 million tons of pure metal), the sedimentary sandstones and siltstones of Udokan represent one of the world's largest copper deposits; a few researchers believe it to be the largest. Unfortunately, the ore is heavily oxidized and complex-

³⁰ *Pravda*, March 5, 1986, p. 6. The AYAM is expected to cost two billion rubles; its allocation for this five-year plan is 150 million rubles. Considering that the span to Tommot is about half the total distance, including the most difficult terrain, its cost alone easily approximates one billion.

³¹ *Izvestiya*, March 5, 1981.

ly mixed with other ores and impurities, making concentration difficult.³²

The success of the project is also greatly dependent upon the status of international markets because the Soviet Union is more than self-sufficient in copper, even when the imports from Erdenet are excluded. Before the onset of the current global copper glut, Soviet officials hoped to involve the Japanese in the development of Udokan, but, according to Dienes who interviewed Japanese trade representatives in Tokyo in 1985, because of Soviet dalliance and the complexity of the ore, the Japanese show little interest.³³

Not yet mentioned in any five-year plan, the development and exploitation of the Molodezhnyy asbestos site suffers from waning interest in asbestos as a resource all over the world. Dienes feels that the USSR will be "lucky" if it is able to maintain its current levels of asbestos exports to Japan, and Japan is the key partner.³⁴ Problems abound with the appeal of other BAM resources as well.

Only timber and, for the time being, coal (Neryungri), each with their own shortcomings, appear to have sufficient promise for payoff on the international market in the immediate future. As I wrote flippantly in 1977, until 1990, wood (and Neryungri coal) would be the most important BAM exports, "and you don't pay off a \$15 billion investment by hauling logs."³⁵ As noted above, the investment has already surpassed \$24 billion (20 billion rubles X 1.2 1985 U. S. dollars) and continues to rise.

According to a recent study of Soviet transport economics: "From an accounting point of view, the BAM seems a marginal investment. In current prices . . . traffic needs to be 50 million ton-km per km *merely to break even* (my italics)."³⁶ Original GOSPLAN projections were for the BAM to average 35 million ton-km per km per year in 1983-85 and 70 to 75 million ton-km per km per year between 1985 and 1990, with even heavier cargoes thereafter. Up to three-fourths of the initial freight was to be West Siberian oil bound for Pacific markets.³⁷ By 1983, Aganbegyan himself had concluded that the new line would not be able to haul more than 30 million ton-km per km before the end of the century.³⁸ In the ab-

³² A. A. Nedeshev, F. F. Bybin, and A. M. Kotelnikov, *BAM i osvoyeniye zabaykal'ya*. Novosibirsk: Nauka, 1979, pp. 93-97.

³³ Leslie Dienes, "Soviet-Japanese Economic Relations: Are They Beginning to Fade," *Soviet Geography*, Vol. 26, No. 7 (September 1985), p. 517; my own interviews in Siberia indicated that the development of the Udokan industrial node crucially hinged on the status of foreign markets. Interviews with Aganbegyan, Mikhaylov (see footnote 23), and G. I. Fil'shin (Irkutsk), March 1985.

³⁴ Dienes, "Soviet-Japanese . . . Relations," p. 517, footnote 33.

³⁵ Victor L. Mote, "Predictions and Realities in the Development of the Soviet Far East," Discussion Paper Number 3 of the NSF-funded/AAG-sponsored research project on *Soviet Natural Resources in the World Economy*. Washington, D.C.: Association of American Geographers, May 1978, p. 62.

³⁶ John Ambler, Holland Hunter, and John Westwood, "Soviet Railways—Lethargy or Crisis?" in ed. John Ambler, Denis J. B. Shaw, and Leslie Symons, *Soviet East European Transport Problems*, pp. 52-53.

³⁷ *Ekonomicheskaya gazeta*, No. 5 (January 1975), p. 13 and N. P. Belen'kiy and V. S. Maslennikov, "BAM: Rayon tyagoteniya i gruzovyye perevozki," *Zheleznodorozhnyy transport*, No. 10 (October 1974), p. 46 in trans. in *Soviet Geography*, Vol. 16, No. 8 (October 1975), pp. 503-513 and in Theodore Shabad and Victor L. Mote, *Gateway to Siberian Resources: the BAM*. Washington, D.C.: Scripta, 1977, p. 132.

³⁸ *Gudok*, April 22, 1983. At the time of my interview with him in Novosibirsk in March 1985, Aganbegyan had revised this to "before 1990."

sence of West Siberian shipments, the BAM now carries less than 20 million ton-km per km per year.

VI. CONCLUSIONS: THE FUTURE OF BAM

Obviously BAM is, as John Hardt once said, a "frozen asset." Currently, its costs clearly outweigh its benefits. It is a long range program, requiring a holistic comprehensive approach. Soviet economists and natural scientists recognize this and have indicated as much in their proposed thirty-year program. Abel Aganbegyan is in Moscow, in part, to ensure that this program is built into the ministries' long range sectoral plans and to help modernize and streamline the structure and procedure of ministerial management of program-oriented approaches. As if to confirm Aganbegyan's mission, Gorbachev frankly declared at a June 11, 1985 Central Committee discussion of ways to accelerate scientific progress:

... the greatest efficiency lies in the sectoral interfaces. To hope that GOSPLAN may be able wade through this labyrinth of interconnecting interfaces in order to select the optimal alternative seems to be an illusion. It doesn't appear to be possible for the ministries either.³⁹

Gorbachev clearly disfavors departmentalism, but some would say that his hard-line economic policies have dealt a death-blow to BAM, AYAM, and other Siberian plans for long-term comprehensive regional development. On the one hand, in view of the guidelines reflected in the current five-year plan, the critics appear to be right. On the other hand, the academicians' own plans, developed *before* Gorbachev assumed power, themselves call for a relative retrenchment between now and 1995: they will concentrate on the development of BAM infrastructure, South Yakutia, Komsomol'sk, and, possibly, North Baykal. As evidenced from Gorbachev's recent visit to the Far East, the General Secretary does not share the same enthusiasm for BAM that his antipenultimate predecessor (Brezhnev) did. Whether this heralds BAM's ultimate demise or just a short-term holding pattern can only be conjectured at this time.

POSTSCRIPT

As this volume was going to press, new information emerged revealing details of the Gorbachev administration's Far East plan. According to the *Financial Times* (August 27, 1987), between now and the year 2000, the government will pour 232 billion rubles (\$367 billion, using the official exchange rate) into a region stretching from Lake Baykal to the Pacific Ocean. Emphasis will be placed on energy self-sufficiency (South Yakutian coal and Sakhalin oil and gas) and food production. Industrial commodity and electricity production is slated to double. No reference was made to the BAM.

SELECTED REFERENCES

In addition to the materials cited in the footnotes, several sources in English stand out as useful synopses of the problem:

³⁹ V. P. Chichkanov, *Printsipy i metody dolgosrochnogo planirovaniya ekonomiki regiona*. Moscow: Nauka, 1986, p. 3.

- Dienes, Leslie (1985), "Economic and Strategic Position of the Soviet Far East," *Soviet Economy*, Vol. 1, No. 2, pp. 146-176.
- Dibb, Paul (1972), *Siberia and the Pacific*. New York: Praeger, 288 pp.
- Jensen, Robert G., Shabad, Theodore, and Wright, Arthur W., eds. (1983), *Soviet Natural Resources in the World Economy*. Chicago: The University of Chicago Press, 700 pp., especially chapter 7.
- Kirby, Stuart (1984), *Siberia and the Soviet Far East. Resources for the Future. Special Report No. 177*. London: The Economist Intelligence Unit, 52 pp.
- Mote, Victor L. (1982), *Case Study of the BAM and East Siberian Transport Capacity Problems. Task C of Soviet Transportation Project*, directed by Holland Hunter. Washington, D.C.: Wharton Econometric Forecasting Associates, December. Office of Soviet Analysis Contract Number 82-N701400-000, 149 pp.
- (1985), "A Visit to the Baikal-Amur Mainline and the New Amur-Yakutsk Rail Project," Vol. 26, No. 9 (November), pp. 691-716.
- North, Robert N. (1978), "The Soviet Far East: New Center of Attention in the USSR," *Pacific Affairs*, Vol. 51, No. 2 (Summer), pp. 195-215.
- Soule, Mason H. and Taaffe, Robert N. (1985), "Mathematical Programming Approaches to the Planning of Siberian Regional Economic Development: A Non-mathematical Survey," *Soviet Economy*, Vol. 1, No. 1, pp. 75-98.
- Shabad, Theodore and Mote, Victor L. (1977), *Gateway to Siberian Resources: The BAM*. Washington, D.C. and New York: Scripta and John Wiley, 189 pp.
- Shaw, Denis J.B. (1985), "Spatial Dimensions in Soviet Central Planning," *Transactions of the Institute of British Geographers*, Vol. 10, pp. 401-412.
- Soviet Geography: Review and Translation* (1960-1984), Vols. 1-25, various issues with articles dealing with BAM and regional planning; see end of year indices. Today called *Soviet Geography* (1985-), Vol. 26-. The editor is Theodore Shabad. See his chapter in this volume.
- Stephan, John J. and Chichkanov, V.P., eds. (1986), *Soviet-American Horizons on the Pacific*. Honolulu, Hawaii: The University of Hawaii, 181 pp.
- Whiting, Allen S. (1981), *Siberian Development and East Asia: Threat or Promise?* Stanford, California: Stanford University Press, 276 pp.
- and Victor L. Mote (1984), *Pacific Basin Transportation Prospect*, Working Papers No. 8 in Soviet Transportation Research Project, directed by Holland Hunter. Washington, D.C.: Wharton Econometric Forecasting Associates, September.
- For materials in Russian, see the reference journal *Problemy BAM*, published quarterly in Novosibirsk since 1975 (footnote 21). The newspapers *Gudok* and *Sotsialisticheskaya industriya* are especially helpful. In addition to the excellent works cited in the text, one other superb study deserves special mention:
- Soblev, Yu. A. (1979), *Zona BAMa: puti ekonomicheskogo razvitiya*. Moscow: Mysl', 227 pp.

TRANSPORT PRESSURES AND POTENTIALS

By Holland Hunter* and Vladimir Kontorovich**

CONTENTS

	Page
I. Summary.....	382
II. Transport in FYP XII.....	382
III. Changing modal responsibilities.....	384
IV. Prospects for Soviet railroads.....	390

I. SUMMARY

The Soviet transport sector is barely managing to cope with traffic demands that are unrestrained by costs. After major bottleneck problems centering on the railroads in 1979 and 1982, the railroads have bounced back while road transport has been in trouble. Transport investment in FYP XII is being squeezed, and prospective freight traffic needs exceed plan provisions. We see no margin for averting bottlenecks during 1987-90.

II. TRANSPORT IN FYP XII

The transport sector has usually met (but just barely) the economy's demands for freight and passenger transport. However, since the mid-1970s congestion at key points on the railroad system has brought bottlenecks that have hampered operations in many sectors of the economy. Delays and shortages spread from sector to sector, eventually hurting transport itself. Such bottlenecks are chronic in the Soviet economy and, as long as planning is excessively taut, they cannot be eliminated. From year to year the locus of major bottlenecks shifts from one sector to another, but the very process of relieving one bottleneck exposes another one somewhere else. As a result, the Soviet economy is always under strain and appears to be performing badly, though it is not about to collapse. Chronic bottlenecks have, in fact, accompanied Soviet output growth for over half a century.

The years 1979 and 1982 were especially bad years for the railroads, but during 1983-86 the rails staged a recovery and other modes performed well (except for road transport). 1986 has been a good year for the sector as a whole. Evidently recent satisfactory performance has led Soviet authorities to plan for further intensification of transport efforts in the current plan period. This policy entails grave risks.

*Haverford College.

**Command Economies Research, Inc.

In FYP XII, the total volume of freight traffic is slated to rise by 12 to 14 percent, at a rate notably lower than those intended for industrial and agricultural output. Soviet planners thus continue the long tradition of anticipating slower traffic than output growth, though the hope is regularly unfulfilled. Table 1 gives provisional estimates for the ton-kilometers to be carried by the railroads and other modes, assuming no changes in the average length of haul for each mode. In the past, key lengths of haul have trended upward. It will be seen that the share of railroads and oil pipelines in total traffic is to fall slightly, while the share of gas pipelines rises. Though detailed data by commodity-group for each mode are not yet available, we are able to show below that FYP XII's freight traffic requirements seem to have been appreciably underestimated.

FYP XII targets are mainly stated in terms of shipments, measured in tons originated, and as the lower part of Table 1 shows, these are dominated in the USSR by road shipments in trucks (81 percent of the total). However the average haul of Soviet truck traffic in 1985 was 11.4 miles (sic) and this kind of local traffic is excluded from intercity traffic in U.S. records. A small fraction of Soviet truck traffic is genuinely intercity, but it is being restricted in favor of rail movement.

TABLE 1.—ACTUAL 1985 AND PLANNED 1990 FREIGHT TRAFFIC, USSR, BY MODE

(In billions of ton-kilometers and millions of tons originated)

Mode	1985	Low 1990	High 1990	Percent increases		Percent shares	
				Low 1990	High 1990	1985	Low 1990
Ton-kilometers (billions)							
Railroads	3 718.4	4 046	4 140	8.8	11.4	47.6	46.3
Oil pipelines	1 312.5	1 379	1 412	5.1	7.6	16.8	15.8
Gas pipelines	1 130.6	1 469	1 494	29.9	32.2	14.5	16.8
Maritime	905.0	996	996	10.0	10.0	11.6	11.4
Trucks	476.2	562	567	18.0	19.0	6.1	6.4
Rivers	261.5	285	285	9.1	9.1	3.3	3.2
Air	3.4	5	5	16.8	33.0	0.0	0.1
Total *	7 807.6	8 742	8 899	12.0	14.0	100.0	100.0
Tons originated (millions)							
Railroads	3 951.2	4 300	4 400	8.8	11.4	12.4	11.6
Oil pipelines	630.8	663	679	5.1	7.6	2.0	1.8
Gas pipelines	482.0	626	637	29.9	32.2	1.5	1.7
Maritime	239.7	264	264	10.0	10.0	0.8	0.7
Trucks	25 873.3	30 530	30 789	18.0	19.0	81.3	82.3
Rivers	632.6	691	691	9.1	9.1	2.0	1.9
Air	3.2	4	4	16.8	25.0	0.0	0.0
Total	31 812.8	37 078	37 464	16.6	17.8	100.0	100.0

Sources: The 1985 data are from *Narkhoz* '85, pp. 323-50. The 1990 ton-kilometer targets are derived from planned percent increases in tons originated, times actual 1985 average hauls. The oil and gas estimates are proportional to intended output increases. For railroads, trucks, rivers, and the total, see V.E. Biriukov in *Plan khoz.*, 1986, No. 6, pp. 18-24. A maritime percent increase appears in *Vodnyi transport*, Nov. 29, 1986, p. 1.

We see several impending sources of transport strain, depending on the specific composition of transport demands. If the regime's hopes for prompt increases in the output of fuels and energy are realized, strong pressure will be brought on the transport sector. Major stress during 1987-90 on the construction sector, MBMW,

construction materials, and other transport-intensive heavy-industry sectors will similarly strain the railroads and other modes. Conversely, if Soviet policy were altered to stress consumer goods and services, the traffic demands would be more easily handled by the transport system.

In spite of these needs, FYP XII is planning only a nominal increase in transport investment compared to actual transport investment during 1981-85, as shown by the provisional estimates in Table 2. The allocations for fixed capital investment in railroads are to rise appreciably (at least in current rubles), from 24 to 28 billion rubles, and their share of the transport-and-communications total is to go up from 23.1 to 26.8 percent. The allocation for communications rises by 40 percent, from 5 to 7 billion. On the other hand the allocation to oil and gas pipelines is cut by 3 from 34 to 31 billion rubles, and the balance for other modes (primarily for roads and trucking) drops from 41 to 39 billion. The railroads and other modes will be able to finance numerous capital improvements, enumerated in their sectoral publications, but many useful projects will have to be deferred.

Total investment for the transport-and-communication sector is to be just over 10 percent of aggregate national fixed investment, down from the 12.4 percent share that transport received during 1981-85. Moreover the nominal increase of a billion rubles in transport investment, comparing 1986-90 with 1981-85, will be eroded by continuing inflation so that in real terms the sector will receive less capital than before, while being asked to deal with a substantial increase in freight traffic.

TABLE 2.—FIXED CAPITAL INVESTMENT IN TRANSPORT AND COMMUNICATIONS, 1981-85 AND 1986-90

[In billions of 1984 rubles]

	1981-85	1986-90	Percent shares	
			1981-85	1986-90
Railroads.....	(a) 24.1	(c) 28.2	23.1	26.8
Other.....	40.9	39.0	39.2	37.1
Subtotal.....	(b) 65.0	(b) 67.2		
Pipelines.....	34.3	(d) 31.0	32.9	29.5
Communications.....	(b) 5.0	(b) 7.0	4.8	6.6
Total T&C.....	(c) 104.3	105.2	100.0	100.0

Sources: (a) Narkhoz '85. (b) V.E. Biriukov in *Plan. khoz.* 1986, No. 6, pp. 17, 21, 26. (c) *Pravda*, July 17, 1986, p. 1. (d) See R. Leggett's paper in volume I.

III. CHANGING MODAL RESPONSIBILITIES

As in all industrial economies, movement of coal, oil, and gas is the largest single assignment of the transport sector; recently fuels traffic has risen to 49 percent of all Soviet freight traffic, measured in ton-kilometers, and the share is likely to rise still more. For background discussion, see the Hunter-Dunn-Kontorovich-Szyrmer article in *Soviet Economy*, July-Sept. 1985, pp. 201-07.

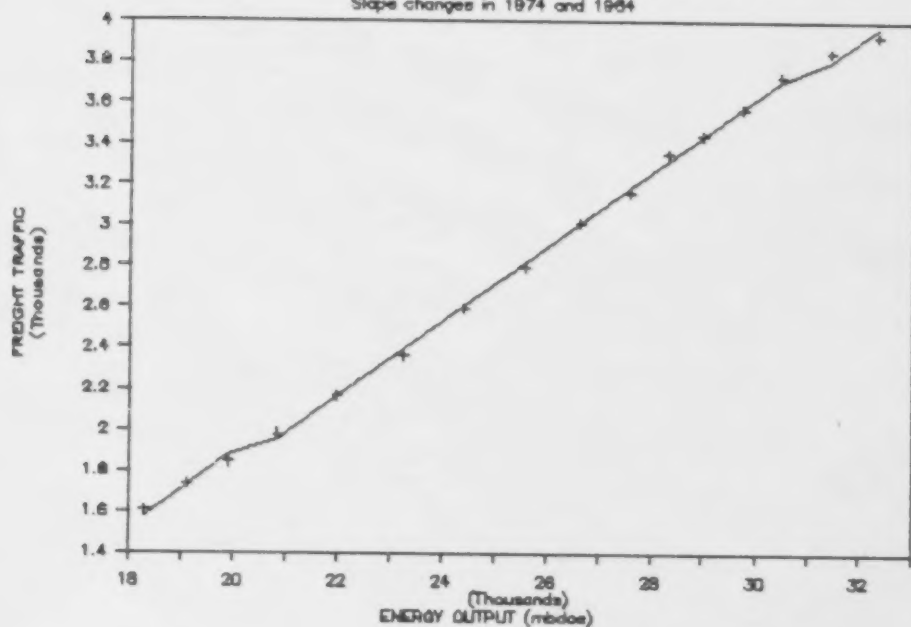
When coal was the basic fuel, railroads were the main carrier. The shift to oil and gas brought rapid expansion of oil and gas pipe-

line networks which now outweigh the railroads in fuels transport. Since oil and gas provide more energy per ton than coal does, the shift tends to reduce the ratio of fuels transport to fuels production. In addition, when the output of hydroelectric power plants and atomic power stations is delivered by long-distance power lines, the "traffic" is not even counted in transport statistics.

Soviet economic geography works in the other direction. As nearby sources of coal, oil, and gas have been depleted, energy supplies have had to be brought from more distant deposits to the main centers of economic activity. Steadily lengthening average hauls have strongly outweighed traffic-reducing factors. The relationship between fuels production and fuels traffic in the last sixteen years demonstrates a far more than proportionate rise in traffic as output has grown. The data are laid out in Table 3 and the relationship is displayed in Chart I.

FUELS TRAFFIC AND ENERGY OUTPUT

Slope changes in 1974 and 1984



NON-FUELS TRAFFIC AND NON-ENERGY GNP

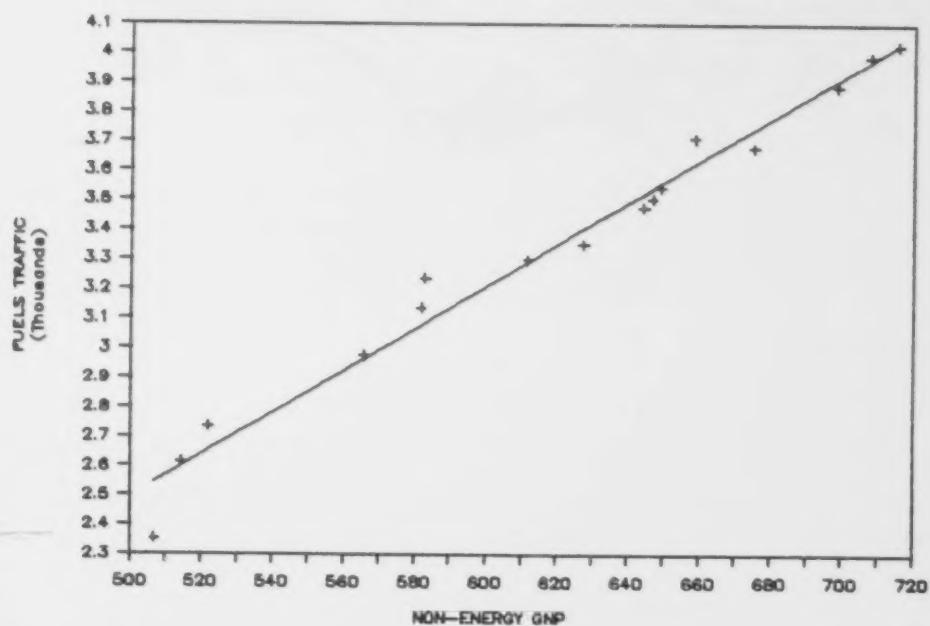


TABLE 3.—AGGREGATE FUELS AND NON-FUELS FREIGHT TRAFFIC, ENERGY OUTPUT, AND NON-ENERGY GNP, USSR, 1970-85

(In billions of metric ton-kilometers, mbdoe, and 1982 rubles)

Year	Fuels traffic	Non-fuels traffic	Energy output	Non-energy GNP
1970	1,603.5	2,352.9	18.3	506.7
1971	1,734.9	2,615.3	19.1	514.4
1972	1,843.3	2,736.7	19.9	522.1
1973	1,981.2	2,976.6	20.8	565.6
1974	2,166.6	3,136.0	22.0	581.7
1975	2,361.6	3,236.8	23.2	582.6
1976	2,595.1	3,299.9	24.4	611.6
1977	2,796.2	3,351.8	25.6	627.3
1978	3,015.6	3,505.4	26.6	646.6
1979	3,160.6	3,477.4	27.6	644.0
1980	3,353.0	3,543.9	28.3	649.0
1981	3,442.4	3,710.6	29.0	658.6
1982	3,571.6	3,679.4	29.7	675.0
1983	3,731.1	3,886.9	30.5	698.6
1984	3,849.5	3,989.5	31.4	707.8
1985	3,933.5	4,028.5	32.3	715.7

Sources: Columns 1 and 2—Soviet Economy, loc. cit. pp. 707-03 plus Narkhoz 85, pp. 323-40; Column 3 PlanEcon databank; Column 4 CIA national accounts estimates.

The upper scatter diagram in Chart I shows how closely fuels traffic is related to energy output, but a line fitted to the whole 1970-85 period indicates that the relationship may have changed slightly after the first three years. A line fitted to 1973-85 is an even better fit. This confirms our earlier finding (in *Soviet Economy*, July-Sept. 1985), that a break in trend occurred in the early 1970's. The line fitted to 1973-85 discloses, however, an appreciable departure from the previous relationship in the last two years, with a reduction in the volume of fuels traffic below what would have been required under previous conditions. If a line is fitted to the years 1973-83 alone, it indicates that actual 1985 fuels traffic was almost 5 percent less than might have been expected.¹ The implication is that new factors tending to economize on fuels transport may be coming into play. For one thing, average hauls may have stopped rising.

The lower scatter diagram in Chart I relates all other freight traffic, i.e., non-fuels traffic, to a composite measure of economic activity—specifically, to Soviet GNP minus the product originating in the fuel and energy sectors. An OLS line fitted to 1970-85 data shows a close relationship, though not as close as the one between energy output and fuels traffic.²

Combining the fuels-traffic relationship with the relationship between non-fuels GNP and non-fuels traffic, we can say something about the freight traffic implications of output targets in FYP XII. PlanEcon forecasts that primary energy output will rise from 32.3 mbdoe in 1985 to 37.3 in 1990. If high-cost efforts to increase crude

¹ Fuels traffic = $-1845.6 + (0.18235 + 0.004602 - 0.00235)$ times energy output. The coefficient t-statistics are 65.52, 3.25, and 2.75.

² Non-fuels traffic = $-1056 + 7.1077$ * Non-energy GNP. The coefficient t-statistic is 23.50.

oil extraction are cut back and fuel production is rationalized in other ways, the forecast is that energy output may rise only to 35.8 mbdoe. The equation derived above says that these output levels would be associated with 5040 or 4763 billion ton-kilometers of freight traffic. FYP XII calls for a 19-22 percent rise in national income; if non-energy GNP were to rise to the same extent, it would be associated with from 4,998 to 5,150 billion ton-kilometers of freight traffic. The indicated range of total freight traffic required for 1990 by FYP XII is from 9,761 to 10,190 billion ton-kilometers, exceeding the planned traffic of 8,742 to 8,899 billion by from 10 percent to 17 percent. The figures are rough but the message is clear: the transport sector will be under strain.

The use of trucks for local transport has been growing rapidly in the USSR, though intercity movement is in its infancy. As the economy's output shifts from bulk commodities to more highly fabricated goods, the speed and convenience of door-to-door movement by truck should assure its rapid growth, outpacing that of other modes. Such growth would be one sign of the modernization of the Soviet economy.

However, the recent performance of road transport, both common carrier and non-common-carrier, has deviated sharply from this trend. Annual growth rates of 5 percent to 10 percent during the 1970s suddenly gave way to absolute declines in 1983-85 (see Table 4). This decline certainly does not reflect a lack of demand: the Ukrainian Minister of Automobile Transport asserts, for example, that his Ministry is currently meeting only 45 percent of the existing demand for intercity service (see *Automobil'nyi transport*, 1985, No. 11, p. 8), and demand for local service is even stronger.

TABLE 4.—COMMON-CARRIER AND NON-COMMON-CARRIER TRUCK TRAFFIC, USSR, 1970-85: TON-KILOMETERS (BILLIONS), TONS ORIGINATED (MILLIONS) AND AVERAGE HAULS (KILOMETERS)

Year	Ton-kilometers			Tons Originated			Average Hauls		
	Common-carrier	Non-common-carrier	Sum	Common-carrier	Non-common-carrier	Sum	Common-carrier	Non-common-carrier	Sum
1970	64	157	221	3,810	10,813	14,623	16.8	14.5	15.1
1971	69	171	240	4,017	11,671	15,688	17.2	14.7	15.3
1972	74	184	258	4,251	12,453	16,704	17.4	14.8	15.4
1973	81	203	284	4,629	13,615	18,244	17.5	14.9	15.6
1974	89	223	312	5,026	14,618	19,644	17.7	15.3	15.9
1975	97	241	338	5,404	15,510	20,914	17.9	15.5	16.2
1976	103	252	355	5,742	15,849	21,591	17.9	15.9	16.4
1977	109	264	373	5,930	16,293	22,223	18.4	16.2	16.8
1978	116	280	396	6,177	17,023	23,200	18.8	16.4	17.1
1979	123	287	410	6,270	16,905	23,175	19.6	17.0	17.7
1980	131	301	432	6,456	17,693	24,149	20.3	17.0	17.9
1981	140	320	460	6,651	18,365	25,016	21.0	17.4	18.4
1982	143	342	485	6,739	19,742	26,481	21.2	17.3	18.3
1983	142	344	486	6,612	19,813	26,425	21.5	17.4	18.4
1984	138	337	475	6,357	19,274	25,631	21.7	17.5	18.5
1985	142	335	477	6,320	19,553	25,873	22.5	17.1	18.4
ANNUAL PERCENT INCREASES									
1971	7.8	8.9	8.6	5.4	7.9	7.3	2.3	0.9	1.2
1972	7.2	7.6	7.5	5.8	6.7	6.5	1.3	.8	1.0

TABLE 4.—COMMON-CARRIER AND NON-COMMON-CARRIER TRUCK TRAFFIC, USSR, 1970–85: TON-KILOMETERS (BILLIONS), TONS ORIGINATED (MILLIONS) AND AVERAGE HAULS (KILOMETERS)—Continued

Year	Ton-kilometers			Tons Originated			Average Hauls		
	Common-carrier	Non-common-carrier	Sum	Common-carrier	Non-common-carrier	Sum	Common-carrier	Non-common-carrier	Sum
1973	9.5	10.3	10.1	8.9	9.3	9.2	.5	.9	.8
1974	9.9	9.9	9.9	8.6	7.4	7.7	1.2	2.3	2.0
1975	9.0	8.1	8.3	7.5	6.1	6.5	1.4	1.9	1.8
1976	6.2	4.6	5.0	6.3	2.2	3.2	—1	2.3	1.7
1977	5.8	4.8	5.1	3.3	2.8	2.9	2.5	1.9	2.1
1978	6.4	6.1	6.2	4.2	4.5	4.4	2.2	1.5	1.7
1979	6.0	2.5	3.5	1.5	—7	—1	4.5	3.2	3.6
1980	5.5	4.9	5.4	3.0	4.7	4.2	3.4	.2	1.1
1981	6.9	6.3	6.5	3.0	3.8	3.6	3.7	2.4	2.8
1982	2.1	6.9	5.4	1.3	7.5	5.9	.8	—6	—4
1983	—7	.6	.2	—1.9	.4	—2	1.2	.2	.4
1984	—2.8	—2.0	—2.3	—3.9	—2.7	—3.0	1.1	.7	.8
1985	2.9	—6	.4	—6	1.4	.9	3.5	—2.0	—5

Source: Annual Markhoz volumes.

What accounts for this dramatic fall? Two hypotheses can be advanced. One would relate it to recent problems in crude oil production and argue that tight restrictions on the availability of gasoline and diesel fuel have forced a decline in truck transport. Long-standing campaigns for fuel economy have indeed been stepped up; efforts are under way also to shift truck engines to diesel fuel, and to introduce the use of compressed natural gas as well.

A second hypothesis focuses on the fact that trucking has been characterized by an unusually high degree of over-reporting. The volume of traffic carried by common-carrier trucks in the RSFSR, for example, is said to be exaggerated by at least 20%.³ Inflation of results in trucking has been considered an important source of upward bias in aggregate growth data, along with price inflation in industry and construction.⁴ The campaign for tightening discipline that began in late 1982 may have cut the degree of over-reporting in trucking. If so, the cessation of growth may be only a statistical fiction. There is, however, no evidence that the degree of exaggeration has in fact declined; complaints about inflated reports are, if anything, more frequent now than they were three years ago.

In addition, one might expect traffic volume (measured in ton-kilometers) to decline more than shipments (measured in tons originated), since both the weight of the shipment and the length of a trip could be over-reported. However, as Table 4 shows, the 1983–85 declines were greater for shipments than for traffic. In the first nine months of 1986, common carrier truck shipments ended their decline and rose by 6 percent. The causes of this recovery are as unclear as the causes of the preceding downturn.

³ See M. Voznesenskii and P. Volin in *Literaturnaia Gazeta*, Feb. 3, 1982, p. 12. See also *Pravda*, July 8, 1984; *Ekonomika*, 1984, No. 38; *Pravda*, March 20, 1985; *Pravda*, June 9, 1985; *Pravda*, May 20, 1986; and M.S. Gorbachev's speech in *Pravda*, June 17, 1986.

⁴ See G.I. Khanin's article in *Izvestiia Akademii Nauk SSSR, Seriya Ekonomicheskaya*, 1984, No. 3, pp. 62–63.

IV. PROSPECTS FOR SOVIET RAILROADS

The scale and intensity of current Soviet railroad operations are unmatched by any other railroad system. Western European and Indian railroads carry more passengers; Japanese and French passenger trains are faster; U.S. and Canadian freight trains are heavier—but in combined volume of freight and passenger traffic carried per kilometer of line, Soviet railroads now bear the world's greatest burden. A more efficient economy might generate less freight, and Soviet railroads would welcome a reduction in demand, but the key question now is whether they can continue to meet the demands placed on them.

For several decades Soviet railroadmen (and women) have performed very impressively, driving their limited plant and equipment to degrees of intensive utilization that are unnecessary elsewhere.⁵ Until recently they have managed a steady rise in the density of freight traffic, i.e., in the ratio of freight ton-kilometers carried to the length of rail line ("road operated in freight service" in U.S. railroad terms). The stock of locomotives and cars increased more rapidly than the length of the network, while the network was improved through double-tracking, heavier rail, better signaling, etc. Train weight and train speed rose gradually, but track occupancy increased more dramatically. Track occupancy is measured as the ratio of annual freight train-kilometers to the length of road operated; when divided by 365 it appears as the average number of trains per day passing a typical point in both directions.

During the 1970s several parts of the Soviet railroad system became so congested that train speed and other performance indicators deteriorated; from 1978 on the railroads began to cause serious bottlenecks in the surrounding economy. Since then there has been substantial recovery (for details, see Vladimir Kontorovich, "Discipline and Growth in the Soviet Economy," *Problems of Communism*, Nov.-Dec. 1985, pp. 18-31, and "The Railroad Crisis of 1976-1982 and the Recovery of 1983-1985," a December 1985 monograph available from PlanEcon, Inc., Washington, D.C.).

Recent railroad developments can be traced through examining data on facilities and operating averages, as laid out for 1970-1985 in Table 5. It shows how difficulties appeared in the '70s and remedies were found after 1982. At first the volume of freight traffic was rising by 4.5 percent to 7.0 percent annually, gross train weight was increasing, average freight train speed was maintained over 33 kilometers per hour, average freight car turnaround time was kept under six days, and daily car runs were kept above 250 kilometers. Then gains ceased and congestion took its toll. Train speed declined, turnaround time increased, and daily car runs shortened. The combined impact appears in the last three columns which record three key performance measures: freight traffic density, freight train productivity, and freight train density. They were steadily improving until the mid-1970s when train productivity

⁵ For background, see Holland Hunter, *Soviet Transportation Policy* (Cambridge: Harvard University Press, 1957); H. Hunter, *Soviet Transport Experience* (Washington: Brookings Institution, 1968); H. Hunter and D. Kaple in U.S. Joint Economic Committee, *Soviet Economy in the Eighties*, Vol. I (Washington: GPO, 1982); Hunter, P. Dunn, V. Kontorovich, J. Szyrmer, and R. North in *Soviet Economy*, July-Sept. 1985, pp. 195-231.

began to decline, and traffic began to falter. After increasing difficulties, the year 1979 saw an actual decline in freight traffic, triggered by bad weather, and though matters improved slightly in 1980 and 1981, the next year saw a railroad crisis.

TABLE 5.—11 RAILROAD PERFORMANCE MEASURES, USSR, 1970-85

Year	1	2	3	4	5	6	7	8	9	10	11
1970	134,884	919	2,561.8	2,574	33.5	5.57	48.09	255.5	19.0	86.2	13.0
1971	135,310	943	2,699.0	2,597	33.8	5.49	48.64	258.2	19.9	87.8	13.5
1972	135,862	986	2,827.1	2,631	33.7	5.56	49.02	254.8	20.8	88.7	13.9
1973	136,531	1,043	3,024.2	2,675	33.8	5.62	49.39	255.2	22.2	90.4	14.5
1974	137,144	1,084	3,164.5	2,703	33.5	5.62	49.65	257.1	23.1	90.6	14.9
1975	137,860	1,161	3,307.2	2,732	33.4	5.84	49.92	248.5	24.0	91.2	15.3
1976	138,403	1,203	3,373.7	2,741	32.9	6.02	50.12	244.5	24.4	90.2	15.5
1977	139,154	1,259	3,408.1	2,758	32.3	6.25	50.66	234.5	24.5	89.1	15.4
1978	140,101	1,285	3,502.7	2,777	32.1	6.36	51.22	233.9	25.0	89.1	15.6
1979	140,782	1,304	3,425.5	2,803	31.0	6.68	51.77	223.9	24.3	86.9	15.0
1980	141,482	1,318	3,521.2	2,819	30.6	6.75	52.33	227.0	24.9	86.3	15.2
1981	142,322	1,300	3,580.8	2,839	30.9	6.63	52.58	232.0	25.2	87.7	15.3
1982	143,039	1,348	3,545.8	2,839	30.6	6.95	52.60	224.0	24.8	86.9	15.1
1983	143,451	1,331	3,681.6	2,870	31.0	6.64	52.63	234.0	25.7	89.0	15.5
1984	143,883	1,313	3,726.1	2,955	31.6	6.49	52.94	239.0	25.9	93.4	15.2
1985	144,718	1,323	3,808.0	3,033	30.9	6.63	54.23	239.0	26.3	93.7	15.0

AVERAGE ANNUAL PERCENT INCREASES

1971	0.3	2.6	5.4	0.9	0.9	-1.4	1.1	1.1	5.0	1.8	4.0
1972	.4	4.6	4.7	1.3	-.3	1.3	.8	-1.3	4.3	1.0	2.8
1973	.5	5.8	7.0	1.7	.3	1.1	.8	.2	6.4	2.0	4.6
1974	.4	3.9	4.6	1.0	-.9	0	.5	.7	4.2	.1	3.0
1975	.5	7.1	4.5	1.1	-.3	3.9	.5	-3.3	3.9	.8	2.7
1976	.4	3.6	2.0	.3	-1.5	3.1	.4	-1.6	1.6	-1.2	.9
1977	.5	4.7	1.0	.6	-1.8	3.8	1.1	-4.1	.5	-1.2	-.5
1978	.7	2.1	2.8	.7	-.6	1.8	1.1	-.3	2.1	.1	1.1
1979	.5	1.5	-2.2	.9	-3.4	5.0	1.1	-4.3	-2.7	-2.5	-3.6
1980	.5	1.1	2.8	.6	-1.3	1.0	1.1	1.4	2.3	-.7	1.6
1981	.6	-1.4	1.7	.7	1.0	-1.8	.5	2.2	1.1	1.7	.5
1982	.5	3.7	-1.0	.0	-1.0	4.8	0	-3.4	-1.5	-1.0	-1.4
1983	.3	-1.3	3.8	1.1	1.3	-4.5	.1	4.5	3.5	2.4	2.4
1984	.3	-1.4	1.2	3.0	1.9	-2.3	.6	2.1	.9	5.0	-2.0
1985	.6	.8	2.2	2.6	-2.2	2.2	2.4	0	1.6	.4	-1.0

1. Road operated in freight service, in kilometers, annual average.

2. Working fleet of freight cars, in thousands of physical units.

3. Operating ton-kilometers (including circuitry), in billions.

4. Gross train weight, in metric tons (including local trains).

5. Freight train speed, including stops, in kilometers per hour.

6. Freight car turnaround time, loaded plus empty, in days.

7. Average load per physical car, in metric tons.

8. Car-kilometers per freight car-day.

9. Traffic density (column 3/column 1).

10. Freight train productivity (column 4*column 5).

11. Train density (column 9/net train weight).

Source: Transcribed or derived from data in primary Soviet sources. For details, write Holland Hunter, Department of Economics, Haverford College, Haverford, PA 19041.

Recovery was launched in late 1982 with replacement of the Minister of Railroads, Ivan G. Pavlovskii, by one of his deputy ministers, N.S. Konarev, who promptly began a harsh disciplinary campaign, firing several senior officials and threatening others. The main emphasis was on forcing operating managers to raise the average gross weight of freight trains. This approach had been tried in the past but never generalized because of the way heavier (which means longer) trains complicate the management of train

assembly, handling at way stations and division points, and disassembly at terminals. Pressure from Moscow nevertheless forced yardmasters and division superintendents to build and move long trains. Heavier trains meant fewer trains, for any given volume of shipments, and this was a way of relieving congestion, especially where it was worst. Even double-track main lines can be overloaded with frequent short trains, so extra-long westbound coal trains between the Kuzbas and Moscow have been given great publicity. At the 27th Party Congress, Minister Konarev spoke proudly of moving a 43,400-ton train on the Tselinnaia railroad!

The 1983 gains in average train weight and speed improved train productivity and further gains were registered in 1984. Turnaround time was cut and daily car runs lengthened. As a result, traffic density in 1983 resumed its upward course, yet this was achieved in 1984 and 1985 with lower train density, i.e., less overcrowding of rail lines with trains.

Systemwide averages conceal large differences between parts of the railroad network, ranging from regions and operating divisions with extremely dense traffic to outlying areas where railroads are not under much pressure. The broad differences are displayed in Table 6, showing length of line, volume of freight and passenger traffic, and several density measures for each of the 32 railroad administrations that operate the Soviet railroad system. In terms of combined freight and passenger train-kilometers per kilometer of line, the national average is 20 thousand, but the five top roads show train densities of 29 to 39 thousand, while train densities for the bottom five run from 2 to 10 thousand. The top five are in the East (West Siberian, South Ural, East Siberian, and Trans-Baikal) or connecting the East with Center (Kuibyshev), the bottom five are on the periphery (Baikal-Amur, Baltic, TransCaucasus, Moldavian, and Lvov). The Moscow and October railroads are the only ones with heavy passenger traffic.

Freight train congestion is worst, as might be expected, on lines where freight train density is highest, and this means especially the coal-carrying lines running west from the Kuznets Basin in western Siberia, and from the Kansk-Achinsk, Ekibastuz, and Karaganda coal fields in the same general area. There are also congested hubs and junctions between resource areas and major cities in the European part of the USSR. FYP XII contains a list of projects to increase capacity and relieve congestion at many such points.⁶

How will Soviet railroads cope with the traffic demands of FYP XII? The railroad recovery of 1983-85 was achieved mainly through organizational pressure, without major improvements in railroad capital plant and equipment. But substituting increased effort and ingenuity for added capital faces upper limits, and diminishing returns appear to be setting in. Minister of Railroads N.S. Konarev, modifying his position that discipline and effort would continue to be enough, made an adroit plea in an interview-article in *Planovoe khoziaistvo* (January 1986, pp. 45-55), for more investment to renovate and expand railroad capacity; as yet there is no sign that his plea is being heeded.

⁶ For a report of Politburo attention, see *Pravda*, May 31, 1986, p. 1.

TABLE 6.—LINE AND TRAFFIC DATA FOR 32 REGIONAL RAILROADS, USSR, 1983

	1	2	3	4	5	6	7	8	9	10
Zapadno-Sibirskaya.....	4,194	233.9	11.1	55.8	2.6	141.0	21.6	162.5	38.8	86.7
IUzhno-Ural'skaya.....	5,034	250.8	9.8	49.8	1.9	151.2	19.0	170.2	33.8	88.8
Vostochno-Sibirskaya.....	2,635	124.1	4.7	47.1	1.8	74.8	9.1	83.9	31.9	89.1
Kuibyshevskaya.....	4,779	186.2	13.1	39.0	2.7	112.2	25.4	137.7	28.8	81.5
Zabaikal'skaya.....	3,436	150.2	4.3	43.7	1.3	90.5	8.3	98.9	28.8	91.6
Moskovskaya.....	9,308	185.8	70.4	20.0	7.6	112.0	136.7	248.7	26.7	45.0
Cor'kovskaya.....	5,721	191.9	17.3	33.5	3.0	115.7	33.6	149.3	26.1	77.5
IUgo'vostochnaya.....	3,589	124.2	9.4	34.6	2.6	74.9	18.3	93.1	25.9	80.4
Donetskaya.....	2,891	96.9	8.1	33.5	2.8	58.4	15.7	74.1	25.6	78.8
Kemerovskaya.....	1,861	64.9	3.4	34.9	1.8	39.1	6.6	45.7	24.6	85.6
Pridneprovskaya.....	3,247	90.9	10.5	28.0	3.2	54.8	20.4	75.2	23.2	72.9
Krasnoyarskaya.....	3,216	103.1	4.9	32.1	1.5	62.1	9.5	71.7	22.3	86.7
IUzhnaya.....	3,678	83.4	15.7	22.7	4.3	50.3	30.5	80.8	22.0	62.3
Sverdlovskaya.....	6,699	193.4	13.2	28.9	2.0	116.6	25.6	142.2	21.2	82.0
IUgo-Zapadnaya.....	4,675	96.9	18.9	20.7	4.0	58.4	36.7	95.1	20.3	61.4
Severnaya.....	6,034	158.8	10.6	26.3	1.8	95.7	20.6	116.3	19.3	82.3
Severo-Kavkazskaya.....	5,685	129.8	16.0	22.8	2.8	78.2	31.1	109.3	19.2	71.6
Tselinnaya.....	5,688	164.3	3.9	28.9	.7	99.0	7.6	106.6	18.7	92.9
Zapadno-Kazakhskaya.....	3,825	93.2	5.8	24.4	1.5	56.2	11.3	67.4	17.6	83.3
Alma-Atinskaya.....	4,402	110.0	5.6	25.0	1.3	66.3	10.9	77.2	17.5	85.9
Privolzhskaya.....	4,769	111.2	8.5	23.3	1.8	67.0	16.5	83.5	17.5	80.2
Odesskaya.....	4,180	81.8	9.0	19.6	2.2	49.3	17.5	66.8	16.0	73.8
Oktiabr'skaya.....	10,164	143.6	36.5	14.1	3.6	86.6	70.9	157.4	15.5	55.0
Azerbaidzhanskaya.....	1,952	38.8	2.2	19.9	1.1	23.4	4.3	27.7	14.2	84.6
Dal'nevostochnaya.....	4,406	80.4	5.3	18.2	1.2	48.5	10.3	58.8	13.3	82.5
Belorusskaya.....	5,443	69.2	12.9	12.7	2.4	41.7	25.0	66.8	12.3	62.5
Sredne-aziatskaya.....	6,343	103.5	6.3	16.3	1.0	62.4	12.2	74.6	11.8	83.6
L'vovskaya.....	4,500	53.7	7.8	11.9	1.7	32.4	15.1	47.5	10.6	68.1
Moldavskaya.....	1,327	15.6	1.5	11.8	1.1	9.4	2.9	12.3	9.3	76.4
Zakavkazskaya.....	2,173	18.3	4.2	8.4	1.9	11.0	8.2	19.2	8.8	57.5
Pribaltiiskaya.....	6,257	46.3	11.2	7.4	1.8	27.9	21.7	49.7	7.9	56.2
Baikalo-Amurskaya.....	1,519	5.1	.2	3.4	.1	3.1	.4	3.5	2.3	88.8
Total USSR.....	143,630	3,600.2	362.3	25.1	2.5	2,170.1	703.5	2,873.6	20.0	75.5

Column headings for Table 6:

1. Length of line (first main track), in kilometers.
2. Revenue ton-kilometers of freight traffic, in billions.
3. Revenue passenger-kilometers, in billions.
4. Freight traffic density, column 2 over column 1.
5. Passenger traffic density, column 3 over column 1.
6. Annual freight train-kilometers, column 2 divided by net train weight (1,659 tons) times 1,000.
7. Annual passenger train-kilometers, column 3 divided by average passengers per train (515) times 1,000.
8. Combined train-kilometers, column 6 plus column 7.
9. Combined train density per kilometer, column 8 over column 1.
10. Freight share of train-kilometers, column 6 over column 8.

Source: Columns 1-3 from V.A. Dmitriev and F.P. Muliukin, "Ekonomika zhel. dor. trans.," 3rd ed., 1985, pp. 78 and 80.

The problem is that traffic demands are rising most rapidly on the lines that are already the most utilized.⁷ The head of USSR Gosplan's transport department cites a study arguing that 50 percent of the network is working at above-capacity levels, with another 14 percent at full capacity.⁸ The demands have been growing most rapidly in eastern regions where, according to Konarev, they are slated to grow at a rate 50 percent higher than elsewhere under FYP XII. Thus even while systemwide averages were improving, an increasing number of line segments has been working above capacity. Some of these lines handle more than 150 trains a

⁷ See the informative brochure by A.M. Makarochkin and IU. V. Diakov, *Povyshenie propusknykh sposobnostei zhel.dorog*, Moscow: Znanie, 1985.

⁸ See D.K. Zotov in *Zheleznodorozhnyi transport*, 1986, No. 4, pp. 33-34.

day in each direction. Signal-block rules allow for intervals of 6-7 minutes headway between trains. Passenger train speeds are cut to match freight train speeds.

Such lines pose an unprecedented set of problems. Regular maintenance and repair of tracks and catenary disrupt traffic to such an extent that it may take days to restore normal schedules. Dispatchers can scarcely record current movements, much less direct impending train movements, which is their primary responsibility. Normal traffic control collapses.

Congestion at yards, terminals, and way stations is also increasing. The drive for longer trains means that longer yard tracks are needed to assemble and disassemble them; this is true also at crew-change points and division boundaries. Without adequate trackage, trains are assembled in two sections on two parallel sidings, then coupled on a main track. This requires added work, and while it may be feasible for sporadic movement of long trains, regular use of long trains will require lengthening yard and station tracks, a costly and time-consuming process, as noted by Minister Konarev in his January 1986 article.

The railroads now have difficulty finding people willing to work on track maintenance and repair, since it is demanding outdoor work. The answer, as elsewhere, has been to introduce specialized equipment that both cuts labor needs and makes the jobs more attractive. But while workers can do some maintenance tasks in the brief intervals between trains, the use of track-occupying machines (e.g., for rail replacement or ballasting), requires interrupting train movement for at least several hours, thus severely disrupting schedules and reducing throughput capacity over an extended stretch of rail territory.

The operating labor force grew during the railroad crisis, in lieu of added capital, but in 1982-83 the growth slowed down and in 1984 and 1985 the railroad labor force actually shrank. It is clear from the Ministry's targets for labor productivity under FYP XII that further cuts are intended. Minister Konarev expects that Soviet railroad workers will have the highest labor productivity in the world by 1990, though the railroads' technological level is still low by international standards. This can only be achieved by some combination of wringing more effort out of workers and adding to railroad capital plant and equipment.

Capital and current outlays will be required to maintain labor morale. The line taken at the 27th Congress suggests that no harsh disciplinary crackdown on workers is in the offing, which means that any extra effort required of railroad workers will have to be bought. At present railroad wages are not high enough, relative to wages for similar occupations, to compensate for the difficulty of railroad jobs.⁹ If more effort is to be elicited from railroad workers,

⁹ So, at least, argues Konarev. In 1984 the average monthly wage on the railroads was 206 rubles, compared to 205 in industry and 229 in construction (*Narkhoz '84*, pp. 417-18).

it seems likely that wages must be raised. Part of an increase might come from redistributing the wages of released workers, as in the widely-publicized experiment on the Belorussian railroad. Alternatively, improving working conditions might raise labor morale, but it will not be cheap. One suggestion for easing the plight of overworked locomotive engineers is to transport them by helicopter to and from their locomotives.

In appraising the likelihood of serious railroad bottlenecks during 1987-90, one can use recent operating experience to weigh the chances that operating officials can solve some difficult problems. We suggest three possible scenarios in Table 7, which relates targets for key performance measures to alternative outcomes. Line 1 shows 1985 operating levels, and line 2 shows the Ministry's most optimistic targets. Expecting that revenue freight traffic will only rise from 3,718 to 4,046 billion ton-kilometers (8.9%) because the average length of haul does not increase, and hoping that gross train weight rises from 3,033 metric tons to 3,500 tons (15 percent), while train speed rises from 30.9 to 39 kilometers per hour (26 percent), thus raising average freight train productivity by 46 percent, the Ministry implies that traffic density would rise by 7 percent while train density would fall by 7 percent. This is highly unlikely.

TABLE 7.—ALTERNATIVE SCENARIOS FOR 1990 RAILROAD PERFORMANCE

	Revenue traffic	Gross weight	Train speed	Freight density	Train productivity	Train density
1985	3,718	3,033	30.9	25.66	93.7	14.64
1990 A	4,046	3,500	39.0	27.50	136.5	13.59
1990 B	4,046	3,320	33.9	27.50	112.5	14.33
1990 C	4,140	3,300	31.0	28.13	102.3	14.75

Source: See text.

A more plausible scenario relates the same assumed 1990 traffic level to the gross train weight called for by the Gosplan transport spokesman and a train speed improving at 1.3 percent per year to the peak level reached in 1967. This would raise freight train productivity by 20 percent, raise the density of freight traffic by 7 percent, and lower train density by 2 percent. If everything went well, an outcome like this seems possible.

However our third scenario seems most in accord with railroad experience. Here the 1990 level of revenue freight traffic is 4,140 billion ton-kilometers because tons originated reach 4,400 million and average hauls do not decline. Gross train weight improves somewhat less and train speed remains at recent levels. As a result train productivity improves by 9 percent, the density of freight traffic rises by 10 percent, and train density goes up to 1 percent over 1985. An outcome like this appears within the present capabilities of the Soviet railroad system, though it will not be easily accomplished.

The campaign to stay ahead of freight traffic demands mainly by raising train weight faces limits imposed by the poor quality of Soviet rails, roadbed, couplings, and airbrake systems. Metal fatigue causes rail fractures when axle loads regularly exceed norms; cou-

pling failure causes long trains to break apart; problems with brakes cause accidents. Because the Railroad Ministry, following Central Committee directives, is pushing the heavy-train policy, criticism in railroad publications is muted, but a recent article in the literary magazine, *Nash sovremennik*, shows that well-informed concern exists.¹⁰ Thus even if the railroads manage to meet the demands placed on them for a few more years, deteriorating track and rolling stock may cripple them in the 1990s.

¹⁰ See M. Antonov in issue number 7, 1986. For incisive analysis of the problems, see William Boncher's monograph, "The Current Soviet Campaign to Increase Freight Weight," (South Orange, N.J.: Seton Hall University, 1985).

GORBACHEV, ECONOMICS AND THE ENVIRONMENT

By Craig ZumBrunnen*

CONTENTS

	Page
I. Summary.....	397
II. Retrospective on Soviet conservation history	398
III. An overview of major problem areas and management successes	399
Chronic water quality problems	399
Water quantity problems	406
Air pollution problems and prevention	408
Nature preservation	410
IV. Environmental protection administration and management	411
V. The environmental paper chase: Environmental legislation	414
VI. Highlights of Soviet international environmental cooperation	415
An introduction to the arms race and the environment	415
Concise overview of Soviet-American environmental cooperation	416
Soviet role in international organizations dealing with the environment	418
Soviet environmental cooperation with CMEA countries	419
VII. Expenditures and investment in environmental protection	420
VIII. Conclusions	422

I. SUMMARY

One of the seemingly inevitable consequences of developing an industrial economy is the emergence of serious environmental problems. Similar to the United States, the overall Soviet record of effectively coping with environmental problems is certainly less than satisfactory. While some significant improvements have been made as will be documented below, very major long term problems exist and will not be easy for the Soviets to solve in ecologically beneficial ways. Included among these serious chronic problems are water quality and quantity, air pollution, deforestation, soil erosion, and wildlife and habitat destruction. In the aggregate these environmental problems appear large enough to pose significant constraints on Soviet efforts to maintain, let alone accelerate, economic growth. Gorbachev's emphasis on intensive rather than extensive growth clearly is intended to help alleviate, if not solve, some of the chronic and deleterious environmental repercussions associated with past shortsighted Soviet approaches to natural resource exploration, evaluation, exploitation, and allocation.

Before exploring the current nature of Soviet environmental problems and prospects a brief historical retrospective seems warranted.

*Associate Professor, Department of Geography, University of Washington, Seattle.

II. RETROSPECTIVE ON SOVIET CONSERVATION HISTORY

It is worthwhile to appraise Soviet environmental problems from both historical and geographical perspectives. For instance, at the time of the Soviet victory in the Civil War, the future Soviet Union was plainly an underdeveloped country. As such, it would seem to have been quite improbable that much, if any, emphasis or awareness existed regarding environmental degradation issues, except for the widespread problems of sanitation and water supply.¹ Surprisingly, however, even in the 1920's the neophyte Bolshevik government enacted a very considerable number of conservation related laws and decrees, many signed by Lenin.² During the late 1960's and early 1970's, the Soviet press placed a great deal of emphasis on these legal documents as testimony of the long standing commitment of the Soviet Union to environmental conservation and protection.³

Not unexpectedly, as the early Soviet industrialization drive began in earnest, concerns over environment protection and conservation took a backseat. This has been the natural pattern for nearly all developing nations. Furthermore, various time lags generally exist between high levels of industrial, urban, and agricultural development and the appearance of most major environmental problems. The exigencies of the times and the efforts directed towards winning the Second World War clearly received appropriate priority over environmental matters. Without doing significant damage to historical accuracy, one may look to the Lake Baykal water pollution controversy in the early 1960's as the turning point in renewed Soviet consciousness and concern over environmental protection.⁴

The second series of factors one must remain cognizant of when trying objectively to explore the Soviet Union's environmental management record is the country's geography. Concisely, these geographical factors can be expressed as a series of inverse geographical distributions between the locations of resource supplies and resource needs. The most obvious and striking is the Soviet Union's water supply and demand patterns. Whereas the more densely populated and heavily industrialized western portions of the country account for approximately 80 percent of the industrial output, they contain only 24 percent of the USSR's fresh water resources. The arid southern regions are even more disadvantaged, constituting 27 percent of the territorial landmass, but receiving only 2 percent of the total fresh water.⁵ This situation is quite unlike the American patterns (with the possible exception of the American southwest), where the major population and industrial

¹ Craig ZumBrunnen, *The Geography of Water Pollution in the Soviet Union*, Ph.D. dissertation, University of California at Berkeley, 1973, pp. 279-358.

² *Ibid.*, pp. 111-114.

³ *Ibid.*, pp. 111-114.

⁴ Craig ZumBrunnen, "The Lake Baikal Controversy: A Pollution Threat or a Turning Point in Soviet Environmental Consciousness?" Chapter 6 in *Environmental Deterioration in the Soviet Union and Eastern Europe*, edited by Ivan Volgyes, New York, Praeger Publishers, 1974, pp. 80-122.

⁵ B. Babich, V. Lozanskiy, and A. Kuzin, "The Conservation and Rational Utilization of Water Resources Is a Major Economic Problem," *Current Digest of the Soviet Press* (hereafter, CDSP), Vol. 32, No. 41 (November 12, 1980), p. 1, translated from *Planovoye khozyaystvo*, No. 8 (August 1980), pp. 97-102.

bases are located in geographical environments with adequate moisture. This inverse locational pattern between supplies and demands also exists with regard to most mineral resources, iron ore being a notable exception with the huge Krivoy Rog deposits in the Ukraine and the Kursk Magnetic Anomaly (KMA) ores in southern European Russia. Siberia looms ever larger in its role as a supplier of energy resources to the entire country and for export. Compared with the United States, the Soviet Union's agricultural land base, while enormous in area, is not nearly as well endowed with regard to length of growing season and quantity and reliability of precipitation. As a further example, the harshness of much of the country's climate in the winter poses serious problems with such processes as the secondary treatment of industrial and municipal waste water. In essence, these various geographical relationships result in added development and transportation costs, productivity constraints, and ecological disruption problems in relatively fragile natural environments. Accordingly, even a total reformulation of Soviet economic institutions would not begin to solve some of the Soviet Union's geographically based environmental problems. What follows is a concise overview of some of the major Soviet environmental problems as well as evidence of progress they have made on some issues.

III. AN OVERVIEW OF MAJOR PROBLEM AREAS AND MANAGEMENT SUCCESSES ⁶

CHRONIC WATER QUALITY PROBLEMS

Some of my own research efforts over the past fifteen years have documented a multitude of chronic Soviet water quality problems as well as some of their triumphs in reducing these pollution problems.⁷ Figure I which follows includes the locations of the places and geographical features cited in the remaining sections of this paper. The Soviet press and technical journals have printed a large number of water pollution accounts over the past couple of dec-

⁶ Except for the discussion of Lake Baykal this section closely mirrors pages 5-12 of a paper presented by the author at the 1987 NATO economics colloquium April 1-3, 1987 in Bruxelles, Belgium, entitled "Soviet Water, Air, and Nature Preservation Problems of the Gorbachev Era and Beyond."

⁷ ZumBrunnen, *The Geography of Water Pollution in the Soviet Union*, op. cit., pp. 1-776; Craig ZumBrunnen, "Institutional Reasons for Soviet Water Pollution Problems," *Proceedings of the Association of American Geographers*, Vol. 6 (April 1974), pp. 105-108; Craig ZumBrunnen, "A Spatial and Quantitative Estimate of the Water Pollution Generating Potential of the Soviet Union: A First Approximation," Discussion Paper No. 40, Department of Geography, The Ohio State University, December 1973, pp. 1-58; ZumBrunnen, "The Lake Baikal Controversy: A Pollution Threat or a Turning Point in Soviet Environmental Consciousness?," op. cit., pp. 80-122; Craig ZumBrunnen, "Water Pollution in the Black and Azov Seas," Chapter 2 in *Environmental Misuse in the Soviet Union*, edited by Frederick Singleton, New York: Praeger Publishers, 1976, pp. 33-59; Craig ZumBrunnen, "Water Pollution," Chapter 5 in the *Ukraine within the U.S.S.R.*, edited by I.S. Koropecykj, New York: Praeger Publishers, 1977, pp. 109-134; Victor Mote and Craig ZumBrunnen, "Anthropogenic Environmental Alteration of the Sea of Azov," *Soviet Geography*, Vol. 18, No. 10 (December 1977), pp. 744-759; Craig ZumBrunnen, "VNDIVO and Ukrainian Water Quality Management," *The Annals of the Ukrainian Academy of Arts and Sciences of the United States*, Vol. 13, Nos. 35-36 (1973-1977), pp. 116-143; Craig ZumBrunnen, "An Estimate of the Impact of Recent Soviet Industrial and Urban Growth upon Surface Water Quality," in *Soviet Resource Management and the Environment*, edited by W.A. Douglas Jackson, Columbus, Ohio: AAASS Press, 1978, pp. 83-104; and Craig ZumBrunnen, "A Review of Soviet Water Quality Management Theory and Practice," Chapter 13 in *Geographical Studies on the Soviet Union: Essays in Honor of Chauncy Harris*, edited by George J. Demko and Roland J. Fuchs, Chicago: University of Chicago Press, Department of Geography, Research Paper No. 211, 1984, pp. 261-294.

ades.⁸ These published accounts indicate that serious chronic water pollution problems still exist along the Azov, Baltic, and Black sea coasts; within the Dnepr, the Dnestr, the Severskiy Donets, the Don, the Ob'-Irtys'-Tom', and the Yenisey-Angara river systems; within the Aral Sea, the Kuban' and the Ural-Volga-Caspian basins; along Lake Baykal; and within lakes and rivers in the Baltic Republics and Karelia, Central European Russia, Transcaucasia, and the heavily industrialized Ural Mountains.⁹

⁸ For a sample listing of such published accounts, see footnote number 36 in ZumBrunnen, "A Review of Soviet Water Quality Management Theory and Practice," *op. cit.*, pp. 267-269.

⁹ For recent pollution accounts, see: *Literaturnaya gazeta*, May 25, 1983, p. 15; *Izvestiya*, July 29, 1983, p. 3; *Ekonomicheskaya gazeta*, No. 30, July 1983, p. 9; *Izvestiya*, August 9, 1983, p. 2; *Pravda*, August 27, 1983, p. 3; *Izvestiya*, October 27, 1983, p. 6; *Zarya vostoka*, November 22, 1983, pp. 1-3; *Izvestiya*, December 31, 1983, p. 3; *Izvestiya*, January 5, 1984, p. 3; *Izvestiya*, January 16, 1984, p. 3; *Pravda*, January 21, 1984, p. 1; *Pravda*, March 11, 1984, p. 3; *Izvestiya*, March 26, 1984, p. 6; *Izvestiya*, April 17, 1984, p. 3; *Pravda*, April 29, 1984, p. 6; *Pravda*, May 21, 1984, p. 7; *Izvestiya*, July 1, 1984, p. 2; *Izvestiya*, July 14, 1984, p. 2; *Sovetskaya kultura*, January 28, 1984, p. 6; *Pravda*, December 28, 1984, p. 3; *Izvestiya*, January 12, 1985, p. 3; *Izvestiya*, March 6, 1985, p. 2; *Izvestiya*, March 9, 1985, p. 3; *Izvestiya*, June 8, 1985, p. 2; *Izvestiya*, June 27, 1985, p. 6; *Pravda*, January 11, 1986, p. 3; *Pravda*, January 12, 1986, p. 3; *Izvestiya*, February 17, 1986, pp. 3 & 6; *Izvestiya*, March 5, 1986, pp. 4-5; *Izvestiya*, June 20, 1986, p. 7; and *Pravda*, December 28, 1986, p. 2.

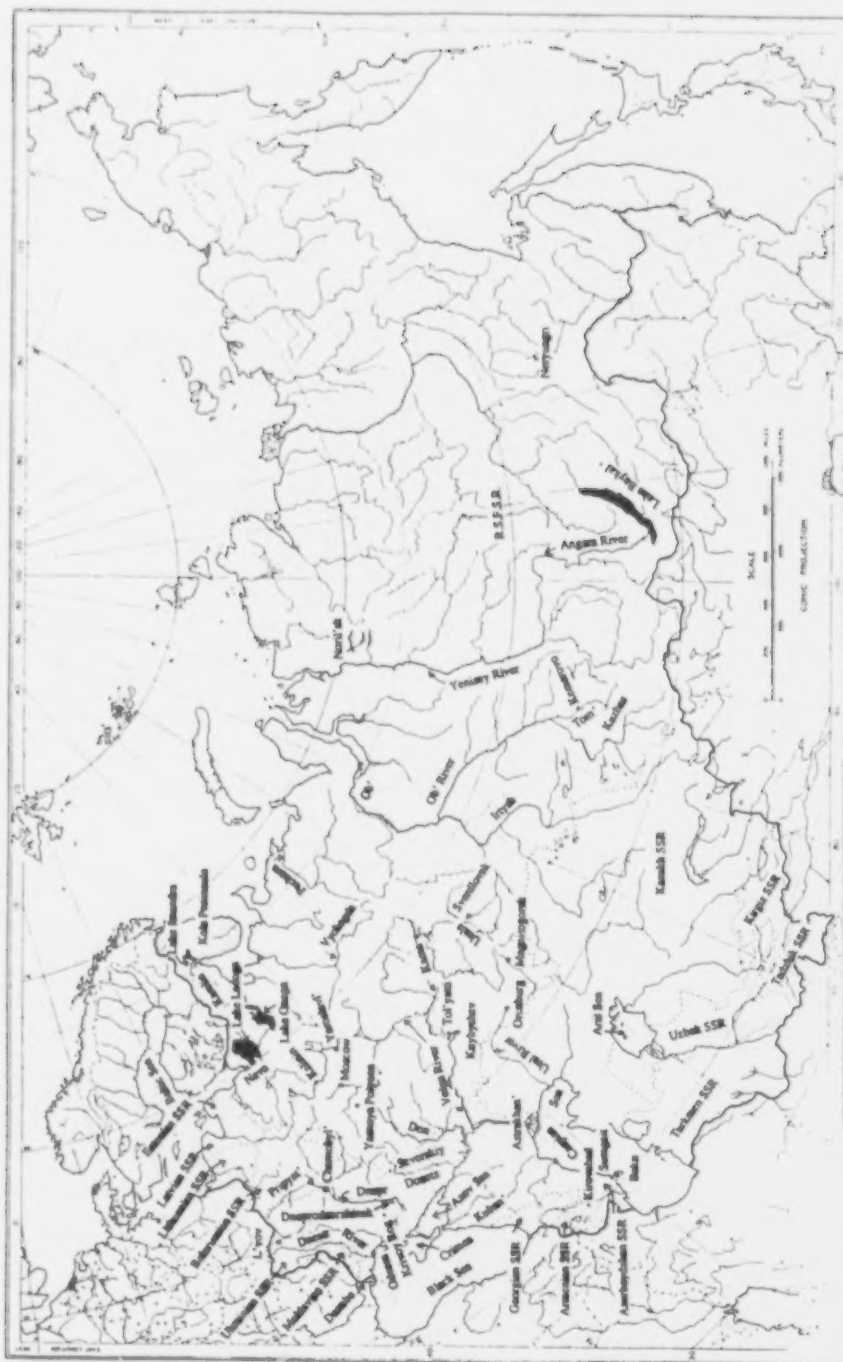


FIGURE 1. Map of Place Names Cited in Text.

While a full descriptive inventory of even a handful of these case studies is precluded here by page limitations, nevertheless, a few highlights are worth mentioning. For example, Lakes Ladoga and Onega in Karelia, and Imandra in the Kola Peninsula are still being invaded by the harmful effluents of the chemical and pulp and paper industries.¹⁰ A flood control project along the Neva River running through Leningrad seems to be producing a real cesspool at the mouth of the Neva River due to various planning errors.¹¹ While pollution from offshore drilling operations in the Baltic, Black and Azov seas has lessened,¹² chronic problems persist and the overall volume of discharged effluents has actually increased along the Baltic Sea coast and other waterways within the Baltic Republics. This situation exists despite a lapse of over ten years since plans were announced for halting these discharges.¹³ In Crimea coastal pollution and groundwater pollution by industrial wastes linger unresolved.¹⁴ Salinity levels continue to rise and the "productive biomass" of the Azov Sea continues to deteriorate as a consequence of both pollution and inadequate river inflow.¹⁵

One of the most well publicized water pollution cases occurred recently along the Dnestr River in the southwestern USSR. An effluent dam burst at the Stebnik potassium fertilizer plant in L'vov Oblast on September 15, 1983, which sent some 4.5 million cubic meters of very saline brine surging down the Dnestr River. Its aftermath included a massive fish kill and various other types of ecological damage.¹⁶ The water supplies of several cities in L'vov, Ivano-Frankovsk, Chernovtsy, Khmel'nitskiy, Ternopol', and Odessa oblasts in the Ukraine and in certain areas of the Moldavian Republic were tainted.¹⁷ Subsequent articles provided details of the criminal investigation into the accident as well as status reports on the improving water quality within the Dnestr Basin.¹⁸

Mixed water pollution reviews are reported from around the country. For example, a resolution calling for the elimination of pollution in the Caspian remains far from fulfilled, especially in the vicinities of Baku, Kirovabad, and Sumgait.¹⁹ While many problems areas still exist along the Volga and Kama Rivers, but at least near the cities of Kalinin, Yaroslavl', Tol'yatti, Kuybyshev, and Astrakhan' the Volga's quality is reported to have improved in recent years. The same positive signs are reportedly true for the Ural River's quality near Orenburg, and Magnitogorsk.²⁰ In the heavily industrialized Ural Mountains 90 percent of the industries in Sverdlovsk Oblast' are now purported to have recycled industrial water supply systems and 82 percent of the waste water is

¹⁰ *Literaturnaya gazeta*, May 25, 1983, p. 15; *Pravda*, March 11, 1984, p. 3; and *Izvestiya*, Jan. 12, 1985, p. 3.

¹¹ For example, see: *Pravda*, May 21, 1984, p. 7; *Literaturnaya gazeta*, October 29, 1986, p. 11; and *Izvestiya*, January 11, 1987, p. 3.

¹² *Izvestiya*, July 14, 1984, p. 2.

¹³ *Izvestiya*, March 26, 1984, p. 6; and *Izvestiya*, June 20, 1986, p. 7.

¹⁴ *Pravda*, August 27, 1983, p. 3; *Izvestiya*, July 14, 1984, p. 2; and *Izvestiya*, March 9, 1985, p. 3.

¹⁵ For example, see: Mote and ZumBrunnen, "Anthropogenic Environmental Alteration of the Sea of Azov," *op. cit.*, pp. 744-759; and *Izvestiya*, January 16, 1984, p. 3.

¹⁶ *Izvestiya*, October 27, 1983, p. 6.

¹⁷ *Izvestiya*, June 27, 1985, p. 6.

¹⁸ *Izvestiya*, July 1, 1984, p. 2; and *Izvestiya*, April 17, 1984, p. 3.

¹⁹ *Izvestiya*, June 8, 1985, p. 2.

²⁰ *Izvestiya*, April 17, 1984, p. 3; and *Pravda*, April 29, 1984, p. 6.

claimed to be subjected to treatment prior to discharge.²¹ Then, too, major pollution control efforts are declared to be progressing well within the Tom' River Basin of the heavily industrialized Kuznetsk Basin of West Siberia.²²

Despite 25 years of argument and debate, the pollution problems at Lake Baykal do not appear to be completely solved; although, a number of efforts to cease pollution of the lake and improve natural resource management in the Baykal environs have been accomplished. For example, loose floating of logs on Baykal's tributaries has been halted and sunken timber has been removed and only "wave-resistant" log rafts are used to convey timber across the lake. New tree-harvesting regulations have been introduced. A new nature preserve along the lake's southern shores has been created and large tracts of tayga forest have been set aside as preserves. Mammals such as the Barguzin sable and Baykal seal have increased in number. Fish such as the *cisco* (a white fish), grayling, and the big white grayling (indigenous only to Baykal) are reported to again be spawning in the Barguzin, Goloustnaya, and Itantsa tributaries to Baykal.²³

Nonetheless, old problems linger and new ones threaten the lake. The fate of Lake Baykal has again been receiving a great deal of publicity in the Soviet press and on radio and television.²⁴ Even at recent writers' congresses many strong speeches were made in reference to the continuing human and economic development threats to the Lake Baykal environs.²⁵ Strong complaints have been voiced that the plans for the Transbaykal Apatite Plant being constructed near the banks of Lake Baykal's largest tributary, the Selenga River, do not include adequate measures for preventing groundwater pollution and pollution of the Selenga River according to the evaluation conducted by the Transbaykal Basin Administration of Water Use Regulation and Protection. Dust generation, the storage of mine tailings, leaks in holding ponds, and the negative effects on fish reproduction of mining blasts—especially for salmon—were also cited.²⁶ The prime sources of pollution of the lake continue to be the "treated" effluents of the Baykal'sk Pulp and Paper Combine and the Selenginsk Pulp and Cardboard Combine. Especially negatively impacted have been the *epishura* crayfish which function as natural biological filters of Baykal's water, normally cleansing 60 cubic meters of water annually. Due to pollution related crayfish morbidity, this filtering effect has been reduced by seven percent. Furthermore, dust, smoke, and gas emissions from the Baykal'sk Combine are reported to be negatively impacting as much as 35,000 hectares of pollution-sensitive fir trees. Not surprising, norms for the plant's dust and gas emissions were not established until fully twelve years after the first pulp was produced and they are still not being observed. Hugh settling ponds or efflu-

²¹ *Ekonomicheskaya gazeta*, No. 30, July 1983, p. 9.

²² *Izvestiya*, August 9, 1983, p. 24.

²³ *Pravda*, January 11, 1986, p. 3.

²⁴ *Izvestiya*, February 17, 1986, pp. 3, 6.

²⁵ For translated coverage of these writer's congresses, see: *CDSP*, Vol. 37, No. 52 (January 22, 1986), pp. 1-9; *CDSP*, Vol. 38, No. 31 (September 3, 1986), pp. 8-10; and *CDSP*, Vol. 38, No. 32 (September 10, 1986), pp. 8-10.

²⁶ *Pravda*, December 23, 1984, p. 3.

ent lagoons constructed in the nearby Solzan ravine are overflowing with sludge containing a high lignin content. Hundreds of thousands of cubic meters of Baykal water are used daily for diluting the treated effluent prior to discharge.²⁷ While the Ministry of Pulp and Paper officials claim that only 0.7 square kilometers are "stained" by the Baykal'sk Combine's effluent, other sources claim the area is 60 square kilometers.²⁸ The costly proposition of diverting the plant's effluent into the Irkut River for ultimate discharge in the Angara below the lake is still being considered.²⁹ Measures for treating the municipal wastes from Ulan-Ude which are polluting the Selenga River are progressing slowly. The USSR Ministry of Non-ferrous Metallurgy's intent to construct a lead and zinc plant in the Kholodnaya River poses a major new pollution threat. Unorganized tourism has also been scored as being harmful because of forest fires and the accumulation of litter. Finally, despite the creation of new preserves and tracts of set aside timber, the organization of nature reserves and national parks was especially singled out for criticism as recently as January 1986.³⁰

From purely an economic-geographic perspective the Baykal'sk Combine is very dubious. The raw material base is inadequate and longhaul timber has to be brought, in from as far away as Khabarovsk Territory and Chita Oblast'. A similar plant in the Angara Basin to the north-northeast would have saved 30 to 40 percent in capital investment, partially due to its lower seismic risk. The Irkutsk Oblast' Party Committee has recommended that the plant be converted into badly needed furniture manufacture.³¹

The situation at present seems to be as follows. On December 28, 1986, a special meeting was held in the Central Committee of the Communist Party of the Soviet Union devoted to the problems of protecting Lake Baykal. Participants included members of the special commission set up by the Central Committee to draft proposals for the increased protection of and rational utilization of Baykal proper and its entire watershed. One of the meeting's outcomes was the instruction to the USSR State Planning Committee to prepare expeditiously a draft resolution outlining specific additional environmental protection measures and timetables taking into account the special commission's recommendations and the various discussions noting both progress in and shortcomings of environmental protection in the Baykal Basin that took place at this December 1986 meeting. As a final follow-up on the Baykal situation, Nikolay Talyzin, a non-voting member of the Politburo and Head of the special Lake Baykal commission, has been recently quoted as saying that, "The situation in the region is today far from being satisfactory," and that "From now on all economic activity in that zone will be strictly monitored, the construction of new (facilities) and expansion of operating production facilities is allowed only in exceptional cases."³² Having followed the Baykal case for fifteen

²⁷ *Pravda*, January 11, 1986, p. 3.

²⁸ *Izvestiya*, February 17, 1986, pp. 3, 6.

²⁹ *Pravda*, January 11, 1986, p. 3.

³⁰ *Pravda*, January 12, 1986, p. 3.

³¹ *Pravda*, January 11, 1986, p. 3.

³² *Seattle Times*, May 11, 1987, p. A4 as quoted in an unspecified issue of *Pravda*.

years, this author is hard pressed to believe that the Baykal situation will quickly be ameliorated, yet just perhaps things might change under Gorbachev.

Finally, the most spectacularly newsworthy recent Soviet pollution problems, of course, are associated with the Chernobyl' nuclear accident. The Pripyat' and Dnepr rivers have been threatened with radioactive waste as have the land resources in the surrounding area. While the accounts of the Chernobyl' event continue to be published, the late Theodore Shabad published an extremely useful 23-page summary document on the geographical and environmental aspects of the accident up through early autumn of 1986.³³ Only time will tell how serious the long term environmental effects of this event really are.

One glimpse at the overall water (and air) quality problems of the USSR can be gotten from Table 1 which lists time-series data on newly installed water and air pollution abatement facilities. The data for waste water treatment capacities are ambiguous. On the one hand, the data indicate an unfortunate downward trend over time. On the other hand, these data may still reflect an overall improvement in waste water treatment as more and more enterprises and municipalities are equipped with such treatment installations; and hence, a sort of "sewage treatment capacity" saturation process may be well underway. Furthermore, the widespread Soviet introduction of closed-cycle industrial water supply systems (see Table 2) helps to lower the need for additional sewage treatment capacity.

TABLE 1.—NEWLY INSTALLED CAPACITY FOR THE PREVENTION OF WATER AND AIR POLLUTION

	1976-80	1981-85	1985
Installations for purifying waste water, in millions of m ³ /day	36.9	26.8	4.0
Water recycling systems, in millions of m ³ /day	121.7	122.1	29.1
Installations for catching and rendering harmless harmful substances from exhaust gases, in millions of m ³ /hours of gas	172.4	200.0	35.6

Source: Narodnoye khozyaystvo SSSR v 1985 g., Moscow: "Finansy i statistika," 1986, p. 387.

The data from Table 2 also require some further explanation. There was a dramatic overall increase in the capacity of such systems between 1982 and 1985 of 15.3 percent or 32.5 cubic kilometers per year.³⁴ In total the recycling systems constitute approximately the entire annual discharge of the Volga River at its mouth. As a percentage of the total industrial water demand, however, the trend is flat. In general, the Transcaucasus region and Central Asia trail behind the rest of the country. Given the general water supply problems of these regions this is confounding. The dramatically reduced proportion supplied by such systems in Lithuania appears to result both from a modest absolute decline in the capacity of such systems and a presumably relatively large growth in industrial water demand in the republic. Nonetheless, the installed capacities of water recirculating systems in the major indus-

³³ Theodore Shabad, "Geographical Aspects of the Chernobyl' Nuclear Accident," *Soviet Geography*, Vol. 27, No. 7 (September 1986), pp. 504-526.

trialized republics, such as Belorussia, the RSFSR, and the Ukraine, is quite noteworthy.

WATER QUANTITY PROBLEMS

The general problems of water supply in the Soviet Union are implicit in Table 2. Without the recycled industrial water supply systems shown in Table 2 the consumptive or non-returned water use by Soviet industries would be nearly 150 percent greater. In his forthcoming book Tolmazin carefully documents the severity and geography of Soviet agricultural, industrial, and municipal water supply problems, for the country as a whole, but especially for the Ukraine.³⁴ He amply discusses many of the major likely ecologically deleterious impacts of the proposed Danube water diversion scheme. Table 3 lists aggregate, presumably consumptive, water utilization for selected years from 1980 through 1985 by the three broad sectors of water usage. Somewhat surprising is the lessening requirements for irrigation water. Presumably this may indicate more rational irrigation practices.

As noted early in this paper the Soviet Union does not have a very good geographical overlap between regions of abundant water supply and regions having high water use demands. This has long been recognized as a problem and, of course, is the geographical reason behind the long discussed and debated plans to divert huge volumes of water from the Vychegda and Pechora rivers of the European North into the Kama-Volga-Caspian Basin and through the Volga-Don Canal into the Sea of Azov. The Danube-Dnepr Canal is another such project in the southern European USSR. A similar massive project to reverse a significant fraction of the flow of the Ob'-Irtys system into the Aral Sea Basin also has been on the planners' drafting tables for years.

TABLE 2.—VOLUME OF CIRCULATING AND REUSED WATER BY UNION REPUBLICS

Region	Total, in Km ³				Proportion of total industrial water demand satisfied by recycled water, in percentage terms			
	1982	1983	1984	1985	1982	1983	1984	1985
USSR	211.9	226.1	237.4	244.4	68	69	70	69
Moldavian SSR	3.0	3.1	3.2	3.2	93	93	93	93
Armenian SSR	1.9	1.8	2.2	2.3	78	77	81	82
Belorussian SSR	6.5	6.6	6.7	7.0	79	79	80	81
Ukrainian SSR	52.8	54.3	58.0	59.5	77	76	78	78
R.S.F.S.R.	128.9	138.0	141.8	145.7	68	70	72	70
Kazakh SSR	7.9	9.7	10.5	11.5	55	58	56	60
Lithuanian SSR	2.8	2.9	3.1	2.9	91	88	64	57
Latvian SSR	0.4	0.4	0.5	0.5	53	54	55	56
Tadzhik SSR	0.2	0.3	0.5	0.6	25	39	47	53
Uzbek SSR	3.8	4.9	6.5	6.5	38	45	52	49
Kirgiz SSR	0.2	0.3	0.4	0.4	26	32	38	39
Azerbaijdzhan SSR	1.3	1.6	1.7	1.8	33	37	38	38
Georgian SSR	0.9	0.9	0.9	1.0	30	34	34	37
Estonian SSR	0.9	0.9	0.9	0.9	23	23	24	26
Turkmen SSR	0.4	0.4	0.5	0.6	21	21	19	21

Source: Narodnoye khozyaystvo SSR v 1985 g., Moscow: "Finansy i statistika," 1986, p. 385.

³⁴ David Tolmazin, *Ukrainian Water Resource Problems*, Edmonton: University of Alberta, forthcoming 1987.

The recent outright scuttling of both the Vychegda-Pechora and the Ob'-Irtysh project has been one of the most ecologically positive and significant decisions of the Gorbachev era.³⁵ While the decision to cancel the Central Asian river diversion project seems to have been very sound both economically and ecologically, it appears highly likely to be laden with overtones of Great Russian chauvinism from the perspective of water-starved Central Asians. Academicians, scientists, private citizens, and writers all played active roles in this debate, most being opposed to the large-scale diversions. In cancelling these schemes the CPSU Central Committee and the USSR Council of Ministers focused attention on utilizing existing regional water resources more economically and efficiently rather than on the massive scale and prohibitively costly diversion projects.³⁶

TABLE 3.—DEMAND FOR FRESH WATER

	Cubic kilometers			In percentage		
	1980	1983	1985	1980	1983	1985
Total.....	288	278	282	100	100	100
In which number:						
For irrigation and agricultural water supply...	161	153	150	56	55	53
For industrial needs (including agricultural production)	105	101	107	36	36	38
For municipal and domestic needs.....	22	24	25	8	9	9

Source: Narodnoye khozyaystvo SSSR v 1985 g., Moscow: "Finansy i statistika," 1986, p. 384.

A critical (i.e., positive) reevaluation of the economic worth of large-scale, and often environmentally harmful, development projects has surrounded the recent chapters in the river diversion debate. For instance, better and more comprehensive cost accounting approaches and ecological considerations have practically sounded the death bell to large dams and reservoir projects.³⁷

In the final analysis, Gorbachev, his successors and their planners for decades to come will be confronted by the stark and sobering reality of severe regional water supply problems over much of the most developed portions of the Soviet Union. These problems already are and in the future will ever more so act as unrelenting geographical breaks on continued economic expansion for both agriculture and industry. In fact, this author's assessment is that water supply rather than water pollution may be the USSR's more intractable natural resource problem.

³⁵ For example, see: *Pravda*, February 17, 1984, p. 3; *Izvestiya*, June 22, 1984, p. 2; *Sovetskaya Rossiya*, August 29, 1984, p. 3; *Pravda vostochna*, January 9, 1985, p. 1; *Sovetskaya Kirgiziya*, April 5, 1985, p. 2; *Pravda*, October 23, 1985, p. 3; *Sovetskaya Rossiya*, December 20, 1985, p. 3; *Sovetskaya Rossiya*, January 3, 1986, p. 3; *Pravda*, February 10, 1986, p. 2; *Pravda*, February 12, 1986, p. 3; *Pravda*, February 12, 1986, p. 3; *Izvestiya*, August 22, 1986, p. 3; *Literaturnaya gazeta*, September 3, 1986, p. 10; *Literaturnaya gazeta*, October 29, 1986, pp. 1, 10; and *Pravda*, November 15, 1986, pp. 1-2.

³⁶ *Pravda*, August 16, 1986, p. 1; and *Pravda* and *Izvestiya*, August 20, 1986, p. 1.

³⁷ *Sotsialisticheskaya industriya*, October 12, 1983, p. 4; *Pravda*, October 10, 1983, p. 1; *Sovetskaya Rossiya*, May 4, 1984, p. 3; *Izvestiya*, August 11, 1984, p. 1; *Izvestiya*, October 20, 1984, p. 2; *Literaturnaya gazeta*, October 24, 1984, p. 11; *Izvestiya*, January 16, 1985, p. 3; *Literaturnaya gazeta*, September 3, 1986, p. 10; *Literaturnaya gazeta*, October 29, 1986, pp. 1, 10; *Izvestiya*, November 30, 1986, p. 2; and *Pravda*, December 1, 1986, p. 2.

AIR POLLUTION PROBLEMS AND PREVENTION

The Soviet Union and the United States differ considerably in terms of the relative contribution of various sources to their respective air pollution problems. The explanation for this situation is rather simple. Whereas industrial smokestacks foul Soviet skies, motorized vehicles perform the same dirty job over major American cities. Nonetheless, vehicle emissions are, unfortunately, also becoming major sources of air pollution in several Soviet cities.³⁸

The Presidium of the USSR Supreme Soviet issued a decree on July 11, 1985, assigning the USSR State Committee on Hydrometeorology and the Environment's State Inspectorate with various tasks in monitoring the protection of the atmosphere.³⁹ Ambient air quality was being monitored in nearly 500 Soviet cities as of 1983. In almost 70 percent of these cities dust, sulfur dioxide, and hydrogen sulfide emissions were reported to have been either stabilized or reduced. All newly constructed industrial facilities were supposedly being outfitted with highly efficient gas scrubbers and dust traps. Nonetheless, air-pollution abatement was unfortunately admitted as being far from adequate for the lungs of Soviet urban residents. For instance, such abatement equipment was found during 1982 to be inoperable or ineffective at the following percentage of industrial facilities being managed by the stated ministries: 17 percent in the USSR Ministry of Petroleum-Refining and Petrochemical Industry, 25 percent in the USSR Ministry of Ferrous Metallurgy, 25 percent in the USSR Ministry of Mineral Fertilizer Production, 27 percent in the USSR Ministry of Nonferrous Metallurgy, and 40 percent in the USSR Ministry of Power and Electrification. Z. Nuriyev, Chairman of the Commission on Environmental Protection and the Rational Utilization of Natural Resources under the Presidium of the USSR Council of Ministers, singled out the atmospheres of the cities of Noril'sk, Kemerovo, and Dneprodzerzhinsk as being particularly dirty.⁴⁰ As of 1985 Lev Tolstoy's estate-museum in Yasnaya Polyana was still being contaminated by the gaseous emissions of the Azot chemical plant after 64 years of repeated efforts and decrees to protect the estate.⁴¹ Ash and slag have been collecting in the vicinities of various Kazakhstan and other power plants.⁴² The burning of high-ash Neryungri coals in the new urban nodes along the BAM (Baykal-Amur-Mainline) was resulting in the precipitation and accumulation of fly ash.⁴³ Overall, industrial smokestacks contaminate the air above nearly all major Soviet industrial cities. The most noteworthy positive improvement in urban air quality has been associated with the shift away from the coal and oil towards natural gas for electricity generation and space-heating within major urban areas. Then, too, winter air quality over many cities in the Transcaucasus, Central Asia, and especially Siberia, is aggravated by chronic winter temperature inversions generated by the persistent Siberian high pres-

³⁸ *Pravda*, July 3, 1985, p. 3.

³⁹ *Izvestiya*, November 29, 1985, p. 3.

⁴⁰ *Kommunist*, No. 15, October 1983, pp. 80-89.

⁴¹ *Sovetskaya Rossiya*, July 9, 1985, p. 4.

⁴² *Izvestiya*, May 28, 1984, p. 2.

⁴³ *Izvestiya*, October 7, 1984, p. 2.

sure cell. As a result, coal and wood burning for space heating in these cities generates serious air quality problems.

TABLE 4.—INTERCEPTION AND NEUTRALIZATION OF HARMFUL SUBSTANCES BEING DISCHARGED FROM STATIONARY SOURCES OF AIR POLLUTION BY UNION REPUBLICS

Region	Quantity of harmful substances intercepted and neutralized by gas and particulate interception structures and installations, in millions of metric tons				Percent of total quantity of harmful substances being discharged which were intercepted and rendered harmless			
	1982	1983	1984	1985	1982	1983	1984	1985
USSR.....	197.1	200.8	205.9	209.3	75	75	76	76
Estonian SSR.....	8.3	8.9	8.6	8.5	92	93	93	93
Kirgiz SSR.....	0.9	1.0	1.0	1.1	80	82	82	83
Moldavian SSR.....	2.3	2.3	2.2	2.2	82	82	82	82
Kazakh SSR.....	21.4	23.8	25.4	27.9	83	83	82	82
Tadzhik SSR.....	0.5	0.5	0.5	0.5	77	78	79	80
Lithuanian SSR.....	1.5	1.5	1.5	1.5	76	77	77	77
R.S.F.S.R.....	118.4	119.1	123.1	123.6	74	74	76	76
Armenian SSR.....	0.8	0.8	0.8	0.7	77	77	76	74
Ukrainian SSR.....	34.9	34.6	34.1	34.8	73	73	73	74
Latvian SSR.....	0.5	0.5	0.5	0.5	66	69	70	71
Belorussian SSR.....	3.2	3.3	3.6	3.2	68	69	71	68
Uzbek SSR.....	2.8	2.8	2.8	2.9	65	64	65	65
Georgian SSR.....	0.6	0.6	0.6	0.6	51	55	52	55
Azerbaijani SSR.....	0.8	0.9	0.9	1.0	45	48	50	53
Turkmen SSR.....	0.2	0.2	0.3	0.3	31	32	34	30

In 1985 the volume of intercepted harmful substances increased by more than 15 million metric tons or by 8% compared with 1980. Despite increased industrial production, as a result of the implementation of atmospheric protection measures, the quantity of harmful substances being discarded into the atmosphere decreased by 5% over the 1981-85 period.

Source: Narodnoye khozyaystvo SSSR v 1985 g., Moscow: "Finansy i statistika," 1986, p. 386.

Table 4 summarizes recent Soviet attempts to entrap particulate matter and render harmless the gaseous emissions generated by stationary sources of air pollution. As can be seen the fraction of these substances intercepted has been essentially a constant 75 percent from 1982 through 1985. Turkmenia again rates last in terms of its air pollution abatement record. Estonia, instead of being next to last as it is with regard to recirculating industrial water systems, ranks first in air pollution abatement. Similar to the industrial water systems, the mere absolute size of the Russian Republic makes it difficult to determine the average percentage of abatement. Despite industrial growth the quantity of substances still escaping into the atmosphere decreased by 5 percent between 1981 and 1985 as noted at the bottom of Table 4. Based on casual empiricism while visiting many Soviet cities over the past nearly two decades, this writer rather doubts the accuracy of the empirical data used to compile Table 4. The guess is that this table overstates the Soviet record with regard to air pollution abatement. The skies of Kiev, Leningrad, and Moscow are very likely to represent a breath of fresh air compared to those of cities in the heavily industrialized Donbas, Kuzbas, or Urals! Scores of published complaints about the quality of air pollution abatement equipment lends further confidence to this author's lamentable assessment that the Soviets have much "visible" work yet remaining before their skies will be "true blue."⁴⁴

⁴⁴ For example, see: *Kommunist*, No. 15, October 1983, pp. 80-89; and *Pravda*, July 3, 1985, p. 3.

NATURE PRESERVATION

The last issue to be analyzed here is the recent Soviet record with respect to nature preservation. The Soviet Union has three categories of land areas under preserved or reserved status: State Nature Preserves called *zapovedniki*, National Nature Parks, and Hunting Preserves. On the one hand, the category of National Nature Parks is a quite new and positive ecological and recreational concept in the Soviet Union. On the other hand, the *zapovedniki* system predates the revolution with the 1912 establishment of the *Lagodekhskiy zapovednik* located in the Georgian Republic. Even the large Barguzin *zapovednik* along the shores of Lake Baykal was formed in 1916.⁴⁵ The history of such nature reserves has fluctuated both in number and area over the years. Nonetheless, as Table 5 clearly reveals, the areal extent of these nature protection units has grown dramatically over the past decade. The total area, in fact, more than doubled from 1975 to 1985. Also implicit in Table 5 is the fact that the more recent Soviet additions to their reserved landscapes have enclosed significantly larger areas. For instance, the Yugan reserve created in 1982, the Olekmin reserve created in 1984, and the Central Siberian reserve created in 1985 encompass 648,636 hectares, 847,102 hectares and 972,017 hectares, respectively. The largest current unit is the 1979 Taymyr preserve carved out of 1,348,316 hectares in the northern part of central Siberia. All four of these large preserves are located in the RSFSR.⁴⁶ Obviously, the larger the territorial extent of a given *zapovednik*, the more ecologically intact it may remain.

An April 1981 resolution of the USSR Gosplan and the USSR State Committee on Science and Technology reaffirmed the status of the *zapovedniki* system.⁴⁷ A detailed description of the climates, soils, landscapes, vegetation, and animals of each reserve was published in 1983.⁴⁸ The stated prerequisite conditions for a Soviet *zapovednik* are the ban on any activity which would be disruptive to the natural complexes of the protected territories except for the carrying out of scientific research, including the continuous monitoring of important natural features.⁴⁹ This objective was certainly not universally observed during the exigencies of World War II, for example, when oil was discovered and pumped on the territory of the Zhiguli Nature Preserve near Kuybyshev.⁵⁰ During a 1983 scientific fieldtrip to the Central Chernozem Nature Preserve near Kursk as a guest of the Moscow Institute of Geography, this author was able to observe various types of scientific research being conducted on the preserve. Clearly, this preserve was being managed more by a multiple-use perspective rather than a pure "ecological or wilderness" one.

⁴⁵ A. M. Geleyeva and M. L. Kurok, eds., *Ob okhrane okruzhayushchey sredy: Sbornik dokumentov partii i pravitel'stva, 1917-1985 gg.*, Moscow: Izdatel'stvo politicheskoy literatury, 1986, pp. 403-407.

⁴⁶ *Ibid.*, p. 406.

⁴⁷ *Ibid.*, p. 403.

⁴⁸ A. M. Borodin and E. E. Syroyechkobskiy, eds., *Zapovedniki SSSR*, Moscow: Lesnaya promyshlennost', 1983.

⁴⁹ Geleyeva and Kurok, eds., *Ob okhrane okruzhayushchey sredy: Sbornik dokumentov partii i pravitel'stva, 1917-1985 gg.*, op. cit., pp. 403.

⁵⁰ Personal inspection by author during IGU Pre-Congress fieldtrip in 1976.

TABLE 5.—NATURE PRESERVES (ZAPOVEDNIKI), HUNTING RESERVES AND NATIONAL NATURE PARKS

	1975	1980	1984	1985
Number of nature preserves and hunting reserves.....	120	135	147	150
Their area in 1,000s of hectares.....	8,683	11,060	14,814	17,549
Number of national nature parks.....	3	7	12	13
Their area in 1,000s of hectares.....	178	411	752	788

Source: Narodnoye khozyaystvo SSSR v 1985 g., Moscow "Finansy i statistika," 1986, p. 385.

A number of Soviet *zapovedniki* have been transferred at the present time into the category of *biospheres* in cooperation with the UNESCO "Man and Biosphere" program with the purpose and goal of helping to protect the genetic fund of both floral and faunal species.⁵¹ The Soviets appear to be quite active and sincere participants in this program. Overall, the recent Soviet efforts and trends in this area of nature protection seem quite admirable and positive.

IV. ENVIRONMENTAL PROTECTION ADMINISTRATION AND MANAGEMENT

Other publications have focused on various theoretical and institutional shortcomings of the Soviet Union's economic system with regard to environmental quality and resource management.⁵² The purpose here is simply to present a very concise generic overview of some of the major institutional reasons for chronic Soviet environmental problems.

The argument has long been made by Soviet and other socialist theoreticians that the Soviet economic system possesses inherent advantages over Western market or mixed-market economic institutions in terms of preventing, or at least, coping effectively with various environmental problems. Simply stated, this argument is based on the theoretical functioning of a triad of Soviet (and socialist) institutions.⁵³

The first of these institutional arrangements is the *lack* of a private profit motive in natural resource usage. Soviet authors are not the only observers to charge quite correctly that a private profit motive has a strong natural tendency to generate social costs, defined as the divergence between private and total costs, such as air and water pollution.⁵⁴ Accordingly, the mere *lack* of a private profit movie is used by the Soviets as *prima facie* evidence of the environmental protection management superiority of the Soviet system. The second part of the triad is the supposed theoretical advantage of public or state ownership and control of natural resources in the Soviet Union. In theory this property rights structure maximizes the general societal welfare rather than that of the private welfare of resource users and decision makers (in the West-

⁵¹ Geleyeva and Kurok, eds., *Ob okhrane okruzhayushchey sredy: Sbornik dokumentov partii i pravitel'stva, 1917-1985 gg.*, op. cit., pp. 403.

⁵² Marshall Goldman, *The Spoils of Progress: Environmental Pollution in the Soviet Union*, Cambridge: The MIT Press, 1972, pp. 43-75; ZumBrunnen, *The Geography of Water Pollution in the Soviet Union*, op. cit., pp. 129-192; Craig ZumBrunnen, "A Review of Soviet Water Quality Management Theory and Practice," op. cit., pp. 261-294.

⁵³ For example, see: Oskar Lange and Fred Taylor, *On the Economic Theory of Socialism*, New York: McGraw-Hill, 1964, pp. 103-108.

⁵⁴ For a critique of the theory and practice of private enterprise, see: William K. Kapp, *The Social Costs of Private Enterprise*, 1971 edition, New York: Schocken Books, 1971.

ern context, read: private resource owners). The third part of the triad is the central planning of exploration, extraction, utilization and allocation of all raw material and biological resources. Unfortunately, there are a number of other theoretical and practical aspects of the day-to-day operation of Soviet economic institutions and behavior which have obviated the above postulated advantageous triad.

For brevity's sake, eight Soviet obstacles to environmental quality will be mentioned without discussion. The West unfortunately shares many of these obstacles with the USSR, but some of them are unique to the Soviet milieu. All of these generic institutional problems are cited in a series of recent Soviet news accounts of the activities of the Commission on Environmental Protection and the Rational Utilization of Natural Resources formed in 1981 under the Presidium of the USSR Council of Ministers.⁵⁵

First, central planning is by no means a panacea. Real resource use conflicts, such as between hydropower generation and irrigation withdrawals, are not easily assumed away by central planning.⁵⁶ Any planning seems to suffer from three generic types of problems (1) lack of sufficient detail in plans, (2) imperfect plan coordination, and (3) inadequate and distorted information.

Second, the Soviet economy is coordinated by vertical flows of information and commands in contrast to market economies which are to a substantial degree coordinated by the horizontal flow of price information. As a result, harmful, yet potentially useful, waste products of one enterprise may simply be discarded into convenient waterways rather than being intercepted and made available as a valuable resource input to another complementary production process, even though the two enterprises may be located quite near each other geographically.

Third, some problems arise from the economic and environmental administrative apparatus. The most obvious one is the lack of clear administrative jurisdiction, overlapping jurisdictions, and duplication of administrative agencies and functions similar to the situation in the United States. Finally, similar to the United States, the Soviet Union has exhibited a chronic propensity to underutilize and misallocate money originally earmarked for pollution control.⁵⁷

Fourth, three general types of regulatory failure occur repeatedly. First, there is lax enforcement of environmental laws, as will be mentioned again in the next section on Soviet environmental laws. In particular, production enterprises are all too commonly placed in operation either without waste treatment facilities being completed or, at least, without the written approval of all three of the legally required inspection services. Second, while in theory quite stringent, the Soviet "maximum permissible concentrations" (pre-

⁵⁵ For example, see: *Izvestiya*, July 29, 1983, p. 3; *Izvestiya*, Sept. 10, 1983, p. 3; *Kommunist*, No. 15, October 1983, pp. 80-89; *Izvestiya*, Nov. 2, 1983, p. 2; *Ekonomicheskaya gazeta*, No. 16, April 1984, p. 17; *Izvestiya*, June 16, 1984, p. 3; *Izvestiya*, July 14, 1984, p. 2; *Izvestiya*, Sept. 22, 1984, p. 2; *Pravda*, July 3, 1985, p. 3; *Izvestiya*, July 3, 1985, pp. 2-3; *Izvestiya*, August 10, 1985, p. 3; *Literaturnaya gazeta*, Oct. 29, 1986, pp. 1, 10.

⁵⁶ For example, see: discussion of such issues in Mote and ZumBrunnen, "Anthropogenic Environmental Alteration of the Sea of Azov," *op. cit.*, pp. 744-759.

⁵⁷ ZumBrunnen, "A Review of Soviet Water Quality Management Theory and Practice," *op. cit.*, pp. 279-281.

del'no dopustimaya konsentratsiya or PDK) of pollutants are often poorly monitored and enforced. Third, the fines for pollution violators have been inconsequential, difficult to assign, and commonly overturned on appeal.⁵⁸

Fifth, while the Soviet Union has produced some notable technological breakthroughs and improvements in water pollution abatement;⁵⁹ nonetheless, it is fair to say that the Soviet Union, in general, lags behind the West in both waste treatment technology and its implementation.

A sixth factor to be noted has long been the irrational (i.e., essentially non-scarcity prices) Soviet resource pricing structure in which many resources, such as water and minerals were treated as free goods. Regardless of institutional arrangements, if a resource is free, nobody has a strong incentive to use the resource prudently.

Seventh, much of the Soviet Union's chronic problems with environmental problems may be traced institutionally directly to its relentless policy of rapid industrialization. Priority has long been on rapidly expanding production and not upon such "non-productive" activities as pollution prevention and nature protection in general. This emphasis led to the evolution of a managerial incentive system in which "plan fulfillment" or "over fulfillment" rather than environmental protection activities yielded the ubiquitously sought after bonuses and intangible rewards.⁶⁰

Finally, open, private citizenry protest and political pressure have played very minor roles in the Soviet Union compared to the environmental movements of Western Europe, Japan, and the United States.⁶¹ The Lake Baykal pollution controversy could be considered a noteworthy exception, but even in this case many of the protagonists were officials of government ministries who had conflicting resource interests, such as the Ministry of Fishing's "clean water advocates" versus the Ministry of Pulp and Paper's "polluters."⁶²

We shall return later to discussions of changes underway from extensive to intensive economic growth strategies and reforms in natural resource pricing policies and their possible impacts on environmental problems. Similar to Western nations, as environmental problems began to manifest themselves one of the key Soviet institutional responses was to promulgate a series of rules, laws, and regulations with the hoped for goal of alleviating environmental problems.

⁵⁸ ZumBrunnen, "A Review of Soviet Water Quality Management Theory and Practice," *op. cit.*, pp. 270-279; and Charles Ziegler, *Environmental Policy in the USSR*, Amherst: The University of Massachusetts Press, 1987, pp. 78-112.

⁵⁹ ZumBrunnen, "A Review of Soviet Water Quality Management Theory and Practice," *op. cit.*, pp. 267-270.

⁶⁰ *Ibid.*, 281-283.

⁶¹ Donald R. Kelly, Kenneth R. Stunkel, and Richard R. Westcott, *The Economic Superpowers and the Environment: The United States, the Soviet Union and Japan*, San Francisco: W.H. Freeman & Co., 1987, various pages.

⁶² For example, see ZumBrunnen, "The Lake Baikal Controversy: A Pollution Threat or a Turning Point in Soviet Environmental Consciousness?" *op. cit.* pp. 80-122.

V. THE ENVIRONMENTAL PAPER CHASE: ENVIRONMENTAL LEGISLATION

The Soviet Union has enacted scores of laws concerning nature conservation and natural resource utilization over the last 30 years.⁶³ The Russian Republic (RSFSR) alone ratified at least 19 nature conservation executive decrees between 1956 and 1960, the most significant of which was the 1960 RSFSR Conservation Law.⁶⁴ All 15 Union Republics had major conservation laws on the books by 1963.⁶⁵ The Soviet Union recently published a compendium volume cataloging major Soviet nature protection and resource management documents and legislation ratified from 1917 through 1985.⁶⁶ While not a complete listing of all such items, it is nonetheless interesting to note the relative number of cited documents by selected time periods. Accordingly, the increased Soviet concern with environmental matters is suggested by the 18 documents enumerated for the decade of the sixties, eleven of which were promulgated in 1968 and 1969. Clearly, the 1970's represent the zenith in terms of Soviet environmental legislative activity with 47 separate documents listed. The record of the first half of the eighties implies somewhat of a reduced pace with 17 major party and governmental documents enacted. It would be folly to assume that this recent reduction in the rate of legal codification reflects the resource management effectiveness of previous legislation.

On paper Soviet environmental laws for the most part appear quite national, yet there have been and continue to be significant problems for a variety of practical and theoretical reasons. For instance, diverse groups of Soviet authors continue to protest that the conservation laws are unsatisfactorily enforced and poorly prosecuted, that appropriate restitution for environmental damages is infrequently ordered by the courts and/or enforcement agencies, and that most laws and judicial decisions involve ineffective fines and administrative reprimands.⁶⁷ Industrial facilities have long been and still often are being operated without purifying installations being completed or working properly.⁶⁸ All-Union and Republic laws have often been in conflict, and various environmental laws apparently have failed to incorporate adequately the non-interference (among uses and users) principle into the planning proc-

⁶³ V.M. Blinova, ed., *Okhrana priroda: sbornik normativnykh aktov*, Moscow: Yuridicheskaya literatura, 1971.

⁶⁴ "Russian Republic Law: On Conservation in the Russian Republic," *CDSP*, Vol. 12, No. 44 (November 30, 1960), pp. 3-5.

⁶⁵ Zigurds L. Zile, "Kolbasov's Legislation on Water Use in the USSR from the Perspective of Recent Trends in Soviet Law," in *Water Law in the Soviet Union*, ed. Irving K. Fox, Madison: The University of Wisconsin Press, 1971, p. 83.

⁶⁶ Geieyeva and Kurok, eds., *Ob okhrane okruzhayushchey sredy: Sbornik dokumentov partii i pravitel'stva, 1917-1985 gg.*, op. cit., 415 pages.

⁶⁷ For example, see: A.L. Yashin, "Moral'nyy dolg nashego pokoleniya," *Priroda*, No. 7 (July 1965), pp. 56-57; T. Sushkov, "Pravovaya okhrana priroda," *Sovetskoye gosudarstvo i pravo* (May 1969), pp. 3-10; G. Filimonov, "Problems and Opinions: Protecting the Environment," *CDSP*, Vol. 30, No. 34 (September 20, 1978), p. 18; "Plenary Session of USSR Supreme Court," *CDSP*, Vol. 38, No. 3 (February 19, 1986), p. 18; ZumBrunnen, "A Review of Soviet Water Quality Management Theory and Practice," op. cit., pp. 266-273.

⁶⁸ For numerous such examples, see Goldman, *Spoils of Progress*, op. cit., various pages; ZumBrunnen, *The Geography of Water Pollution in the Soviet Union*, op. cit., various pages; ZumBrunnen, "A Review of Soviet Water Quality Management Theory and Practice," op. cit., pp. 266-272 and accompanying footnotes; Yu. Khrenov, "The USSR Supreme Soviet Between Sessions: Who is Indebted to Nature," *CDSP*, Vol. 37, No. 23 (July 3, 1985), p. 22.

ess.⁶⁹ This latter, so-called, "departmental approach," is a very real obstacle to the comprehensive processing and/or pollution abatement of Soviet industrial and agricultural waste products. This multitude of interbranch waste processing and disposal conflicts recently has led to the call for the creation of an interbranch scientific and technical complex, tentatively named the "Secondary Resources and the Comprehensive Utilization of Raw Materials," under the joint auspices of the USSR State Committee for Science and Technology and the USSR State Committee for Material and Technical Supply.⁷⁰

Nonetheless, the impression that legal enforcement is totally wanting should not be given. For example, over the past several years many industrial enterprises have been required to closedown due to pollution violations.⁷¹ The Soviet press commonly mentions fines being levied and criminal sentences being rendered for pollution violations and fish and animal poaching.⁷² Many of these same reports complain about the overworked employees and understaffing of various regulatory agencies; and again, the all too common ineffectiveness of fines and legal sanctions to deter poaching or pollution.

This latter point seems implicit in the continuing concerns of the Politburo with the report of the USSR State Committee on Hydro-meteorology and the Environment on the country's efforts to protect the natural environment against pollution.⁷³ Directive after directive seems to be issued designed to ameliorate or prevent pollution. Z.N. Nuriyev, Vice-Chairman of the USSR Council of Ministers, apparently voiced major critical remarks on the observance of environmental protection and natural resources legislation at the 11th USSR Supreme Soviet in July of 1985.⁷⁴ Finally, during the third quarter of 1987 additional proposals for improving legislation for strengthening Soviet environmental protection are scheduled to be introduced.⁷⁵

VI. HIGHLIGHTS OF SOVIET INTERNATIONAL ENVIRONMENTAL COOPERATION

AN INTRODUCTION TO THE ARMS RACE AND THE ENVIRONMENT

Over the past twenty years or so the Soviet Union has endeavored to become a leading actor on the world stage addressing such issues as population growth, energy resources, food production, and environmental protection. As Ziegler notes, little attention has been paid in the West to the foreign policy implications of these

⁶⁹ Zile, "Kolbasov's Legislation on Water Use in the USSR from the Perspective of Recent Trends in Soviet Law," *op. cit.*, pp. 78-79.

⁷⁰ *Pravda* and *Izvestiya*, March 4, 1986, pp. 4-5.

⁷¹ For example, see: *Izvestiya*, August 9, 1983, p. 2, for a discussion of sanctions imposed on industrial firms along the Tom' River in Kemerovo Oblast'.

⁷² For examples, see: *Izvestiya*, December 4, 1985, p. 6; *Pravda*, December 18, 1986, p. 6; *Izvestiya*, October 7, 1984, p. 2; *Izvestiya*, July 27, 1984, p. 6; *Izvestiya*, July 14, 1984, p. 3; *Izvestiya*, June 3, 1984, p. 3; *Pravda*, October 21, 1983, p. 3; and *Izvestiya*, October 29, 1984, p. 6.

⁷³ "In the Politburo of the CPSU Central Committee," *CDSP*, Vol. 38, No. 13 (March 30, 1986), pp. 19-20.

⁷⁴ *Izvestiya*, July 4, 1985, p. 1.

⁷⁵ *Vedomosti Verkhovnogo Soveta SSSR*, No. 37 [2371], September 10, 1986, Item 782, pp. 729-736.

Soviet international cooperative efforts.⁷⁶ During the Brezhnev era cooperation on such issues appears to have been, at least partially, predicated on the hope that cooperation on these above issues could possibly facilitate the forging of cooperative agreements on more intractable issues such as arms control. In fact, the Soviets have long argued that their concern over environmental contamination caused by nuclear fallout from atmospheric testing was a major impetus behind their signing, along with Great Britain and the United States, of the Partial Test Ban Treaty on August 5, 1963.⁷⁷ Not without some reasonable justification the Soviets have diminished their own contribution to such fallout by focusing on the much larger number of American atmospheric tests conducted prior to the signing of the treaty. SIPRI data collaborate this Soviet claim.⁷⁸ The American response to the Soviet invasion of Afghanistan in December 1979 demonstrated the fragility of any hopes that agreements in the above mentioned non-military and non-political arenas would help in a major way to facilitate bilateral and international treaties in more military-strategic areas.

CONCISE OVERVIEW OF SOVIET-AMERICAN ENVIRONMENTAL COOPERATION

Prior to the 1979 invasion of Afghanistan one could point to the concurrent signing in May 1972 of the SALT I agreement and the US-USSR Agreement on Cooperation in Environmental Protection as a visible bilateral link between progress on arms control and progress on environmental protection. The latter agreement provided for a Joint Committee on Cooperation which held regular meetings until the above mentioned Afghanistan invasion. The Nixon-Brezhnev environmental accord led to a number of comparative studies on such wide ranging environmental topics as water and air pollution, conservation and establishment of nature preserves, soil erosion, agricultural pollution, wildlife and habitat protection, and the protection of marine environments.⁷⁹ An EPA report at the end of 1979 claimed that 39 different bilateral environmental projects were being conducted under the auspices of this accord.⁸⁰ This author had the privilege in 1975 to represent the U.S. Environmental Protection Agency on two water pollution modeling efforts under the aegis of this agreement.⁸¹

As Ziegler⁸² notes, the Afghanistan invasion, Reagan budget cuts, and the Soviet downing of KAL 007 significantly curtailed the number and scale of such projects and the number of participants

⁷⁶ Charles E. Ziegler, *Environmental Policy in the USSR*, Amherst: University of Massachusetts Press, 1987, p. 134.

⁷⁷ *The Test Ban*, Stockholm: SIPRI, 1971, p. 1.

⁷⁸ *Ibid.*, pp. 18-19.

⁷⁹ *Izvestiya*, November 16, 1972, p. 1.

⁸⁰ See: *Report on the Implementation of the US-USSR Agreement on Cooperation in the Field of Environmental Protection During the Period February 1979 to December 1979*, Washington, DC: U.S.E.P.A., December 10-13, 1979.

⁸¹ The author was part of a three-member U.S. team which studied for three-weeks in the spring of 1975 at VNIIVO (All-Union Scientific Research Institute for Water Pollution) in Khar'kov and delivered a paper at the American-Soviet Symposium on the Use of Mathematical Models to Optimize Water Quality Management held in Khar'kov and Rostov-na-Donu in December 1975.

⁸² Ziegler, *Environmental Policy in the USSR*, *op. cit.*, p. 137.

in the exchanges. For example, Gary Waxmonsky,⁸³ an EPA environmental accord official, noted that the number of participants involved in the exchanges decreased dramatically from 316 in 1979 to only 67 in 1984. In a positive attempt to turn this deteriorating record around at the November 1985 Reagan-Gorbachev summit in Geneva, a new bilateral accord on environmental cooperation was signed.⁸⁴

Soviet-American environmental cooperation has taken place alongside rather continuous Soviet criticism of the United States' environmental record, especially in the Third World. Two of these criticisms are well founded. The first was Soviet, as well as other nations', criticism of the American widespread use of chemical defoliants in Vietnam. The Soviets have long argued that the American "ecocide" practices in Southeast Asia are clear evidence for their claim that environmental problems take a distant backseat to the interests of the American military-industrial complex.⁸⁵ The second involves the concept of "pollution havens" or the export of so-called "dirty industries" from America, Japan and Western Europe to various Third World nations that badly need jobs and capital investment; and hence, have little leverage to enforce stringent environmental protection measures on polluting, foreign-owned, multi-national factories and processes.⁸⁶ Accordingly, while cooperating on various technical matters and questions surrounding environmental problems, many Soviet writers, as Ziegler⁸⁷ notes, have continued to point to capitalist policies and practices and the arms race as the root causes of global environmental problems.

As Ziegler⁸⁸ articulates, international environmental cooperation has been advocated by reformist Soviet policy makers. For example, commenting on the various 1972 bilateral agreements on space exploration, health, trade, science and technology, and environmental protection, Georgiy Arbatov, director of the Institute for the Study of the USA and Canada, praised both the substantive and political importance of such agreements.⁸⁹ Ziegler's assessment seems even more sound under the Gorbachev regime. It should be acknowledged that the United States has benefited from these exchanges in regard to cold weather biological treatment of wastes, the organization of nature preserves, earthquake prediction, and some industrial waste water treatment processes.⁹⁰ One cautiously hopes for a continued expansion of truly collaborative Soviet-American efforts in the area of environmental problems and protection.

⁸³ Gary R. Waxmonsky, "The US-USSR Environmental Agreement," paper presented at the Kennan Institute Conference on US-Soviet Exchanges, June 26-27, 1984.

⁸⁴ Ziegler, *Environmental Policy in the USSR*, *op. cit.*, p. 137.

⁸⁵ *Ibid.*, p. 139 as cited from G. Khozin, *The Biosphere and Politics*, Moscow: Progress Publishers, 1979.

⁸⁶ Craig ZumBrunnen and Fran Klodawsky-Spector, "Multinationals: Obstacles to Environmental Pollution Control?," in *Programme et/and Resumes*, Vancouver, B.C.: The Canadian Association of Geographers, May 1975.

⁸⁷ Ziegler, *Environmental Policy in the USSR*, *op. cit.*, pp. 136-141.

⁸⁸ *Ibid.*, pp. 139-141.

⁸⁹ G. Arbatov, "On Soviet-American Relations," *CDSP*, Vol. 25, No. 15 (May 9, 1973), p. 3.

⁹⁰ Donald R. Kelley, "American-Soviet Cooperation on Environmental Protection and Conservation," *Sectors of Mutual Benefit in U.S.-Soviet Relations*, Nish Jamgotch, editor, Durham, N.C.: Duke University Press 1985.

SOVIET ROLE IN INTERNATIONAL ORGANIZATIONS DEALING WITH THE
 ENVIRONMENT

Over the past decade and a half the Soviet Union has participated in a number of international conferences and institutions related to environmental questions. In the early 1970's the Soviet Union threatened to boycott two conferences on the environment, the original 1971 environmental conference organized by the United Nations Economic Commission for Europe (ECE) and the 1972 Stockholm Conference on the Environment. In the both cases the Soviet boycott was precipitated by the exclusion of East Germany. In the former situation a compromise was worked out, but in the latter the Soviets did finally boycott the Stockholm meetings even though they supported the goals of the conference.⁹¹

The Soviet Union signed all three parts of the final agreement promulgated at the Conference on Security and Cooperation in Europe. Clearly, they were most interested in the first part dealing with formal recognition of postwar European boundaries, whereas Western nations focused on the third part dealing with human rights issues. Environmental protection questions are contained in the second part and were then and have continued to be rather noncontroversial.⁹²

At the 1976 meeting of the Economic Commission for Europe, however, the Soviet Union proposed a series of controversial European-wide environmental conferences. The controversy centered around the different priorities of the Soviet-bloc versus the West European nations. The Soviets argued that such conferences were within the scope of the Helsinki Accords' provision for greater technical cooperation; and specifically, the Soviets wanted these conferences to include consideration of the arms race's impact on the environment. The Western nations claimed that these Soviet efforts were designed to divert attention away from human rights issues, would duplicate the tasks of other UN organizations, and would excessively burden the ECE's mission.⁹³

Ziegler argues that the Soviet Union is very hesitant to sign agreements or participate in supranational institutions which might threaten Soviet sovereignty.⁹⁴ While his argument appears sound, the same argument could be made about the United States' or any other nation's willingness to participate in international activities which could impinge upon their sovereignty. For example, while the Soviet Union was a signatory to the UN Convention on the Law of the Sea, the United States has still not. Furthermore, the provisions of the Soviet Union's decree, "On the USSR Economic Zone," (the formal domestic codification and implementation of the 200 nautical mile economic zone extending offshore of Soviet territories) which went into effect March 1, 1984, were in accord with the Law of the Sea.⁹⁵ Also, to their credit the Soviets have

⁹¹ Josef Fullenbach, *European Environmental Policy: East and West*, London: Butterworth's, 1981, pp. 169-170.

⁹² Ziegler, *Environmental Policy in the USSR*, op. cit., p. 144.

⁹³ *Ibid.*, p. 146.

⁹⁴ *Ibid.*, p. 145.

⁹⁵ *Izvestiya*, March 1, 1984, p. 2.

been active participants in the United Nations' Environment Program as is noted elsewhere in this paper.

Supporting Ziegler's thesis, however, is the initial Soviet record of resisting the international regulation of whaling. In July 1982 the International Whaling Commission (IWC) voted to cease all commercial whaling operations by 1986. No international sanctions were coupled to this vote and initially the USSR joined Brazil, Iceland, Japan, Norway, Peru, and South Korea in opposing the ban. By July 1983 only Japan, Norway, and the Soviet Union still opposed the whaling moratorium. Marine mammal lovers were heartened, however, by the Soviet Union's unexpected pronouncement at the July 1985 IWC meeting that it would not engage in commercial whaling in the 1987-88 season. At the same time, the Soviets declared that for "technical reasons" they were temporarily halting all commercial whaling operations.⁹⁶ Then on May 22, 1987, the Soviet Union announced that it was permanently halting all whaling. This action could possibly ease the U.S. restrictions on Soviet fishing in American territorial waters imposed in 1985 because of Soviet violations of IWC rules.⁹⁷

In summary, this author agrees with Ziegler⁹⁸ that Soviet bilateral environmental agreements have probably been more genuinely beneficial to the resolution of environmental problems than has Soviet participation in more truly international organizations where political and ideological issues often overshadow the value of the environmental projects. It seems that the Soviets view bilateral agreements in a more favorable light as well.⁹⁹

SOVIET ENVIRONMENTAL COOPERATION WITH CMEA COUNTRIES

In addition to bilateral environmental agreements with the United States and other Western nations and general international and United Nations' environmental cooperative accords, the Soviet Union also has environmental protection agreements and projects with CMEA countries. CMEA cooperation on air and water pollution was mandated in 1964, but little progress appears to have been made until 1971.¹⁰⁰ At that time the CMEA nations created a Joint Council for the Protection of the Environment with the stated task to further scientific and technical coordination of environmental protection measures.¹⁰¹

Water supply and water pollution issues have been the central focus of much of the CMEA's cooperative efforts. For example, the five countries bordering on or containing the Tisza River basin, namely, the USSR, Czechoslovakia, Hungary, Romania, and Yugoslavia, developed a comprehensive plan for fishing, transportation

⁹⁶ Ziegler, *Environmental Policy in the USSR*, op. cit., pp. 145-146.

⁹⁷ "Soviets to Halt Whale Hunting," *Seattle Times*, May 24, 1987, p. A2.

⁹⁸ Ziegler, *Environmental Policy in the USSR*, op. cit., p. 147.

⁹⁹ V. Vasil'yev, V. Pisarev, and G. Khozin, *Ekologiya i mezhdunarodnyye otnosheniya*, Moscow: Mezhdunarodnyye Otnosheniya, 1978, pp. 95-96, 111.

¹⁰⁰ B. Gorizontov and V. Prokudin, "Environmental Protection in Comecon Member Nations," *Problems of Economics*, Vol. 21, No. 8 (December 1978), pp. 24-40; and R. A. Novikov, ed., *Problema okruzhayushchey sredy v mirovoy ekonomike i mezhdunarodnykh otnosheniyakh*, Moscow: Mysl', 1976, pp. 224-225.

¹⁰¹ B. Gorizontov, "The CMEA Countries Solving Ecological Problems," *International Affairs*, (Moscow) No. 6, (June 1980), p. 113.

and recreation usage of the basin's water system.¹⁰² The CMEA countries have installed a number of water quality monitoring stations which measure pH, sulfur content, electrical conductivity, water temperature, and water level. The Soviets have urged an extensive division of labor amongst themselves and their East European neighbors to manufacture pollution control equipment.¹⁰³ For instance, the water quality monitoring equipment for the Soviet Union's automated pollution control pilot project along the Severskiy Donets River in the southeast Ukraine was Polish-made.¹⁰⁴

Due to relative high levels of coal burning, air pollution is a critical problem in Eastern Europe.¹⁰⁵ Ziegler notes that the Institute for Atmospheric and Refrigeration Technics in Dresden is charged with the responsibility of coordinating CMEA research on the scrubbing of dust and exhaust gases, the use of aerosol and gas by-products of the chemical industry, and the elaboration of maximal permitted concentrations (PDKs) of pollutants in the ambient atmosphere.¹⁰⁶ The increasing problems associated with acid rain and transfrontier air pollution were deliberated at a 1982 CMEA meeting.¹⁰⁷

Two other areas of CMEA cooperation may be mentioned. One is the methodological basis for environmental monitoring. By 1975 over 150 environmental indicators were approved. In 1981 the CMEA countries agreed to modernize and further develop these indicators. The second area refers to environmental problems associated with urban agglomerations. These stated problems include, such things as air, soil, and water pollution, waste recycling, noise abatement, land recultivation, and the articulation of a set of principles for urban construction.¹⁰⁸

The full benefits of these cooperative efforts are limited by the lag in true economic integration of the CMEA countries and such facts as Romania's resistance to both political and economic integration.¹⁰⁹ In this regard Gorbachev's policies will probably at best only be able to make slow headway.

VII. EXPENDITURES AND INVESTMENT IN ENVIRONMENTAL PROTECTION

The Soviet Union has recently been publishing compiled data on its expenditures for environmental protection and the rational use of natural resources. The most current data are included in Tables 6 and 7. Table 6 enumerates the 1985 industrial expenditures for such uses by republic grouped into four macro regions. The RSFSR's figure, of course, heavily biases the average All-Union percentage increase from 1980 to 1985. In the Baltic republics both

¹⁰² A. Kozyrev, "Sotrudnichestvo v okhrane okruzhayushchey sredy," *Ekonomicheskiye nauki*, No. 3 (1981), pp. 38-39 as cited by Ziegler, *Environmental Policy in the USSR*, op. cit., pp. 148-149.

¹⁰³ Ziegler, *Environmental Policy in the USSR*, op. cit., p. 149.

¹⁰⁴ Author's personal discussions with VNIIVO officials in Khar'kov and field excursions to the Severskiy Donets basin in May 1975.

¹⁰⁵ John M. Kramer, "The Environmental Crisis in Eastern Europe: The Price for Progress," *Slavic Review*, Vol. 42, No. 2 (Summer 1983), p. 218.

¹⁰⁶ Ziegler, *Environmental Policy in the USSR*, op. cit., p. 149.

¹⁰⁷ Kramer, "The Environmental Crisis in Eastern Europe: The Price for Progress," op. cit., p. 218.

¹⁰⁸ Ziegler, *Environmental Policy in the USSR*, op. cit., p. 149.

¹⁰⁹ *Ibid.*, pp. 148-150.

Latvia and Lithuania have shown significant increases over the five-year period. The industrial heartland republics of the Ukraine, the RSFSR, and Belorussia conform to the national trend for increased expenditures. Transcaucasia, Georgia ranks second only to Lithuania, while Armenia and Azerbaydzhan trail considerably behind the national average. Turkmenia stands out as the only Central Asian republic that has experienced a level of increased expenditures exceeding the national average. Remembering that Turkmenia ranked at the very bottom in both Tables 2 and 4, and, this upsurge in the level of industrial expenditures for environmental protection appears plainly warranted.

TABLE 6.—EXPENDITURE OF BASIC FUNDS BY INDUSTRIES FOR ENVIRONMENTAL PROTECTION AND RATIONAL USE OF NATURAL RESOURCES BY UNION REPUBLICS IN 1985 (AT END OF THE YEAR)

Region	Millions of rubles	1985 as percent of 1980
USSR.....	20,970	150
Estonian SSR.....	150	126
Latvian SSR.....	95	163
Lithuanian SSR.....	175	198
R.S.F.S.R.....	14,066	151
Ukrainian SSR.....	3,757	155
Belorussian SSR.....	517	143
Moldavian SSR.....	110	126
Armenian SSR.....	133	126
Azerbaydzhan SSR.....	185	126
Georgian SSR.....	119	190
Kazakh SSR.....	1,115	142
Kirgiz SSR.....	55	128
Tadzhik SSR.....	50	144
Turkmen SSR.....	56	187
Uzbek SSR.....	387	134

Source: Narodnoye khozyaystvo SSR v 1985 g., Moscow: "Finansy i statistika," 1986, p. 388.

Table 7 presents the state capital investment trends for measures designed to protect the environment and make more rational use of resources. It is troubling that the steep upward trend from the 1971-75 plan period to the 1976-80 plan period was reversed absolutely with regard to both water and air resources capital investments for the 1981-85 period. The evidence and data for water and air resource problems presented earlier in this paper would seem to warrant increased rather than the decreased absolute levels of capital investments in air and water resources. The share of the overall total expenditures in areas other than air and water resources, however, grew from 14.2 percent in the 1976-80 plan period to 19.2 percent in the 1981-85 period. N. I. Ryzhkov claims though, that as a result of the implementation of various planned scientific and technical measures in the field of resource conservation during the 12th Five-Year Plan as compared to the 11th Five-Year Plan that savings in the unit cost of industrial production will grow by 175 percent, thus, totaling 28.6 billion rubles.¹¹⁰ In summary, despite a plethora of decrees, resolutions, and publications exhorting more efforts in the area of environmental protec-

¹¹⁰ *Pravda*, June 19, 1986, pp. 1-5.

tion it would appear that these levels of capital investment are still too picayune. Clearly implicit in this situation is the Soviet Union's increasingly severe problems with generating sufficient investment capital throughout its economy.

TABLE 7.—STATE CAPITAL INVESTMENT IN MEASURES FOR NATURE PROTECTION AND RATIONAL USE OF NATURAL RESOURCES

[In constant prices; millions of rubles]

	1971-75	1976-80	1981-85	1985
Nature protection measures and rational use of natural resources	7,291	10,824	11,120	2,486
In which number:				
For protection and rational use of water resources	5,411	8,338	8,087	1,683
For atmospheric protection	725	950	899	234

The total sum of expenditures for nature protection and rational use of natural resources (including outlays in the forestry economy) amounted to about 43 billion rubles in the 1981-85 period, of which more than 9.5 billion rubles were expended in 1985.

Source: Narodnoye khozyaystvo SSR v 1985 g., Moscow: "Finansy i statistika," 1986, p. 387.

VIII. CONCLUSIONS

This short overview paper of some of the Soviet Union's environmental problems leaves much omitted. Problems such as land reclamation and irrigation, soil erosion and salinization, biocide usage, over-fishing and the destruction of spawning beds, timber harvesting practices and replanting rates, wildlife preservation and habitat destruction and poaching have unfortunately, but necessarily, been ignored. Indeed, all of these and a host of other environmental and resource problems are major concerns receiving various levels of attention by the Soviet leadership.

A perusal of the final version of the Communist Party Program and Party Statutes of the 27th CPSU Congress provides a few hints as to the vision the Gorbachev leadership has for responding to these various environmental challenges now and into the future. Two quotations from the final version of the Party Program¹¹¹ seem most germane:

Scientific and technical progress should be aimed at a radical improvement in the utilization of natural resources, raw and other materials, fuel and energy at all stages—from the extraction and comprehensive processing of raw materials to the production and use of the final product. It is necessary to accelerate the pace of lowering the material-intensiveness, metal-intensiveness and energy-intensiveness of the national income. Resource conservation will become a decisive source of satisfying the growth of the national economy's requirements for fuel, energy, and raw and other materials.

Price formation must be improved, so that prices will more accurately reflect the level of socially necessary outlays, as well as the quality of products and services, and will more actively stimulate scientific and technical progress, resource conservation. . . .

While both of these quotes are relevant to the four problem areas addressed in this paper, they pertain to much broader Soviet environmental and natural resource management questions as well. The first quotation describes Gorbachev's rational goal of achieving economic growth through intensive (i.e., more efficient

¹¹¹ Proletarians of All Countries Unite! The Program of the Communist Party of the Soviet Union (New Version).—Adopted by the 27th CPSU Congress," CDSP, *Special Supplement*, December, 1986, pp. 8-12.

use of resource inputs) as opposed to extensive means (i.e., an emphasis on the growth of inputs). The Soviets have little choice but to try to actively cultivate such strategies because natural resource scarcities in terms of absolute availability, quality, and costs are becoming ever more problematic for a large number of industrial raw materials, including for the purposes here water supplies for agriculture, industry and municipal use.

Major reforms in price formation seem crucial to any hoped for Soviet successes in addressing their complex natural resource management challenges. Article 15 of the 1970 Soviet Water Law specifically stated that water use was to be free; nonetheless, a potentially very hopeful event occurred as of January 1, 1982, when water use charges were introduced everywhere in the USSR for water taken from "water resource systems" by industrial enterprises.¹¹² Water charges for irrigation use have been and are being experimented with again today. Furthermore, a number of proposals for effluent discharge charges have been proposed.¹¹³ The USSR State Planning Committee has received a number of practical proposals for improving plan indices related to environmental protection and rational natural resource utilization. At least up to 1983 the only ecological expense figured into the unit cost of the output of Soviet industries was the above noted water consumed from water-intake systems. The mining industry now at least has to take into account outlays for land recultivation in its unit costs.¹¹⁴

A joint decision by Gosplan, the USSR State Construction Committee, and the Presidium of the Academy of Sciences led to the articulation and enactment in October of 1983 of "Temporary Standard Rules for Determining the Economic Effectiveness of the Implementation of Environmental Protection Measures and Evaluating the Economic Damage Done to the National Economy by Pollution of the Natural Environment."¹¹⁵ The guiding principle of these rules is a benefit-cost analysis of the cost of environmental protection measures against the magnitude of the environmental pollution damage which they would prevent. In a recent article Academician T. Khachaturov, chairman of a committee of the Presidium of the USSR Academy of Sciences established to explore ways of improving the above cited temporary standards, strongly criticized the effectiveness of these temporary standards and elaborated a number of very promising and positive new approaches related to accounting for expenditures, increased judicial and administrative fines, and special funds and bonuses.¹¹⁶ In December 1986 many of these features were discussed by the Research Council on the Cost-Effectiveness of Fixed Assets, Capital Investments and New Technology. These are all very positive recent developments in Soviet attempts to articulate truly comprehensive and effective ecologic-economic planning indices.

¹¹² *Ekonomicheskaya gazeta*, No. 2, January 1982, p. 2.

¹¹³ ZumBrunnen, "A Review of Soviet Water Quality Management Theory and Practice," *op. cit.*, pp. 284-292.

¹¹⁴ *Pravda*, November 14, 1983, p. 7.

¹¹⁵ *Ekonomicheskaya gazeta*, No. 16, April 1983, p. 17.

¹¹⁶ T. Khachaturov, "Restructuring the Economic Mechanism: Economic-Accountability Interests and Ecology," *CDSP*, Vol. XXXIX, No. 14 (May 6, 1987), pp. 13 and 20.8.

The pervasive environmental concerns voiced at the previously cited recent Soviet writers' congresses serve as but one bit of evidence for this author's view that environmental concerns and problems are not about to fade into the background of the consciousness of either the Soviet populace or leadership.¹¹⁷ The Gorbachev leadership seems to be using environmental concerns as a vehicle for allowing, if not indeed encouraging, the expression of pent-up criticisms of bureaucratic mismanagement and corruption. In the process a quasi-democratic dialog critical of the Soviet Union's management of the environment is being heard within ever wider circles of Soviet society. Furthermore, the Guidelines for the 12th Five-Year Plan provide a general laundry list of environmental protection and rational resource use goals.¹¹⁸ In his political report to the 27th Party Congress General Secretary Gorbachev stated:

A firm rule must be established according to which the over-consumption of resources is disadvantageous and economizing receives a tangible reward

and that:

More resolute economic, legal and educational measures are necessary here. All of us living today are accountable for nature to our descendants and to history.¹¹⁹

He has simply and correctly set out the tasks and hopefully this paper provides some insight into the sheer number of and magnitude of these obstacles and difficulties. These present and future environmental paradoxes will require a truly Promethean effort from Gorbachev and his citizens if they are to be able to achieve their desired goals of sustained high levels of economic growth and well-being. Environmental protection measures are only a stopgap, yet perhaps necessary, step on the way towards the noble, but unfortunately unachievable, objective of a waste-free technological society.

¹¹⁷ For translated coverage of these writers' congresses, see: *CDSP*, Vol. 37, No. 52 (January 22, 1986), pp. 1-9; *CDSP*, Vol. 38, No. 31 (September 3, 1986), pp. 8-10; and *CDSP*, Vol. 38, No. 32 (September 10, 1986), pp. 8-10.

¹¹⁸ *Pravda*, November 9, 1985, pp. 1-6.

¹¹⁹ *Pravda*, February 26, 1986, pp. 2-10.

COMMENTARY

By Robert G. Jensen*

Given the continental scale and varied pattern of human and natural resources of the Soviet Union, it is hardly surprising that transportation and regional development issues have long been problematic features of Soviet economic plans. As the previous three chapters suggest, this is certainly not less true in the 12th Five-Year Plan. Indeed, to sound the *Leitmotiv* of the Gorbachev program, one might easily conclude that transportation and regional development problems will "intensify" during the rest of this decade and beyond.

One set of problems highlighted by the papers in this section has to do with challenges posed by certain basic features of the economic geography of the USSR. Perhaps the most formidable challenge is to overcome the extreme separation between capital resources, which, along with the majority of population and demand, are concentrated in the European USSR and raw material supplies, which are located mainly in Siberia. This is the classic "east-west" problem that has long confronted Soviet planners. But in recent years, as more favorably located resources in the European USSR have become depleted, Soviet authorities have been forced to depend increasingly on high-cost development of energy and industrial raw-material supplies in remote and environmentally inhospitable regions of Siberia. The resulting steady increase in the average length of haul, as Hunter and Kontorovich note, has not only increased the burden on the transport sector, thereby increasing the risk of bottlenecks, but also has offset gains from transport reducing factors that would otherwise generate net savings.

The papers by Shabad and Mote also focus on issues related to the east-west dichotomy of capital and resources but with attention to more general issues of regional development strategy and regional planning. However, before taking up the issues and conclusions of individual papers, it should be noted that the bulk of the increment to the labor force is and will be occurring in Soviet Central Asia and other regions of the non-Slavic south. Thus Soviet transportation and regional development strategy must overcome an increasingly trichotomous geographical distribution of the factors of production, linking capital, labor, and resources across great distances.

TRANSPORTATION PRESSURES AND POTENTIAL

One can only agree with Hunter and Kontorovich that the intensification of transportation efforts suggested by the 12th Five-Year

*Department of Geography, Syracuse University.

Plan is a high risk strategy. On the other hand, such a strategy is entirely in accord with a long tradition of keeping transport investment to a minimum and of usually unfulfilled hopes that traffic generation will increase more slowly than growth in production. The Soviet model of development in this respect embodies a philosophy of "transportation lag" that stands in sharp contrast to the Western experience based on "transportation lead." Nonetheless, despite the resulting pressures, the transportation sector has usually managed to meet the demands placed upon it by the economic system. The 12th Five-Year Plan, in my view, will not be much different in this respect.

Since fuels and industrial raw materials are such a large component of freight traffic, much will depend on the extent to which the burden placed on transport by the east-west dichotomy of resources and markets will be offset by greater efficiency in energy and raw material utilization, as called for by the Gorbachev economic program. If the energy and material intensity of the Soviet economy can be reduced by technical improvements and better management, the demands on the transport sector will increase more slowly than in the past. Most would agree that there is considerable potential for freight reduction on the demand side of the equation. On the supply side, however, it is likely that the Gorbachev administration will be forced to increase its reliance on remote and costly resource development projects in Siberia and this will have the opposite effect. The balance between these forces is difficult to predict, but clearly the 12th Five-Year Plan is predicated on transport reducing factors at least offsetting long hauls from Siberia to industrial centers in the European USSR.

Although it is appropriate to focus attention on the railway network and pipelines in the movement of raw materials from Siberia to centers of demand, the modernization of the Soviet economy will require improvements in other forms of transport as well. The past emphasis on a "unified" transport system that avoids duplication of competitive modes does provide certain efficiencies, but it does not allow the flexibility and convenience that will be required as output shifts from bulk commodities to more highly fabricated goods. Hunter and Kontorovich are thus correct in pointing to a need for improvements in road transport and increases in inter-city trucking. Anyone who has driven from place to place in the USSR will recognize that such improvements will require heavy investment in order to overcome past neglect. However, this problem can be approached on a regional basis by giving priority to road networks and infrastructure that would enhance links within and between the large urban agglomerations of established industrial areas.

PROSPECTS FOR SIBERIA

Soviet five-year plans have traditionally given disproportionate attention to Siberia in comparison to other regions of the USSR. Given the ideological, strategic, and political factors outlined by Shabad, Siberia has provided the ultimate regional development challenge for the Soviet economy. Ambitious projects there, ranging from the Ural-Kuznetsk Combine in the 1930s to the more

recent "project of the century" (the Baikal-Amur Mainline), and the West Siberian energy programs, including the "contract of the century" (the gas for pipe deal), have provided a highly visible index of Soviet economic achievement. Despite major advances in the region, however, the earlier vision of Siberia as a comprehensively developed region, fully integrated into the mainstream of national economic life, has become increasingly blurred. Indeed, if Shabad's analysis of the Gorbachev program is correct, that vision may have been entirely removed from the economic agenda.

Nonetheless, as Shabad notes, Siberia has become an important, integral part of the Soviet economy. Even if the 12th Five-Year Plan results in a relative shift of investment to the more developed western regions, certain sub-regions and projects in Siberia will continue to receive priority attention. The oil and gas regions of West Siberia are the most obvious examples, partly because they are oriented toward the west and linked to centers of demand by an extensive pipeline network. On the other hand, the prospects for those regions facing the Pacific Basin, a focus of national attention over the past decade, appear dim by comparison. Yet the malaise Shabad senses in East Siberia and the Far East may simply signal a period of consolidation in response to a declining demand for the products of these regions. Certainly Gorbachev and his advisors must recognize that recent structural changes in the Japanese economy have reduced the potential of that market for Siberian raw materials in the near future. Given the strong demands for capital investment elsewhere, it is not surprising that Gorbachev may want to pull back from additional high-cost developments east of Lake Baikal.

In light of the overall emphasis of Gorbachev's modernization program the assertion that "a fundamentally new stage is beginning in the development of Siberia and the Far East . . . in achieving economic comprehensiveness" (*Pravda*, June 19, 1986) strikes me as wishful thinking. If anything, the 12th Five-Year Plan suggests a greater commitment to specialized development in those areas and more generally a growing acceptance of a classic core periphery relationship between the European part of the country and Siberia, with the latter mainly supplying energy and raw materials to the former. As a result, the economic profile of Siberia appears destined to narrow even further. At best, the grand hope of comprehensive Siberian development has implications only for the 21st century.

Although one would not conclude that the 12th Five-Year Plan is a "Siberian" plan, this does not mean that it should be considered a "European" plan. It is not, in my view, a milestone in that sense. All recent five-year plans have emphasized labor productivity, modernization and expansion of existing facilities, and growth based on technological progress, an emphasis that in geographic terms suggests a "pro-European" bias. To the extent that Gorbachev's program is more determined in this respect, it represents a continuing evolution of Soviet regional development policy toward an emphasis on growth rather than economic equality.

REGIONAL PLANNING AND THE BAIKAL-AMUR MAINLINE

During the Soviet period, only a few projects have received more attention than the BAM and its associated service area. The national media blitz that accompanied the railway construction and opening up of a hitherto undeveloped region probably raised expectations beyond anything the project could sustain in its initial phases. Thus, even though the long-term plans for the BAM may be on target, as Mote indicates, there appears to be a sharp decline of interest as the less glamorous work of developing the infrastructure of the region gets underway. However, since the overall schedule for development does call for a period of consolidation or retrenchment between now and 1995, Gorbachev's apparent lack of enthusiasm for the BAM does not necessarily signify a major shift in priorities or provide evidence of the project's demise. Of course, if scheduled projects, such as Udokan and Molodezhnyy, do not promise a payoff then one would expect investments to be targeted elsewhere.

One of the risks of complex, long-term projects is that the conditions upon which they are predicated may change before they are brought on line. With the exception of its military-logistical function, the BAM appears to have been aimed at a rapidly moving target and, temporarily at least, missed. As Mote points out, the BAM today faces a very different domestic and international situation than it did in the 1970s. Long term benefits may yet justify the project, but these are impossible to access with precision because they are not likely to occur until well into the 21st century.

The magnitude and geographic scale of the BAM makes it an attractive laboratory for investigating Soviet regional development policy and more especially regional planning. In the case of the former, the project lends itself to interpretation in the context of a long-standing aspiration for a more equal development of all the USSR's major regions. However, the notable lack of attention to macroregional differentials in all recent five-year plans, including the 12th, suggests that the general issue of regional equality is no longer part of any serious agenda. If that assessment is correct, then we should not seek a rationale for the BAM in that context.

On the other hand, as outlined by Mote, the development of the BAM zone highlights the problems of Soviet regional planning extremely well. Sectoralism versus territorialism, vertical versus horizontal planning, central authority versus local autonomy, etc.—all the inherent and perhaps eternal dilemmas of a centrally planned economy are revealed as tensions in the BAM service area. The question would seem to be whether the new emphasis on intensification will favor one approach over another. In any event, though the BAM region may require a holistic or comprehensive approach for efficient development, it will require investments and markets even more. If Mote and Shabad are correct, Gorbachev is not inclined to the former and he has little control over the latter. In terms of the resource motives of the project, the BAM is indeed well described as a "frozen asset."

X. FOREIGN ECONOMIC RELATIONS

OVERVIEW

By William H. Cooper*

Foreign economic relations have played a small role in the Soviet economy for most of the 70 years of the U.S.S.R.'s existence. In 1985, for example, exports accounted for only about 4 percent of Soviet GNP and the ratio of imports to GNP was also around 4 percent. Much of the foreign trade the Soviet Union has conducted has been through clearing arrangements with the centrally planned economies of Eastern Europe.

The small level of foreign trade has been due, in part, to the structure of the Soviet economy. The Stalinist system, which remains in place today with minor modifications, is based on the objective of achieving self-sufficiency. Domestic production has been geared toward import substitution. Foreign trade has been used to obtain necessary technology and goods that cannot be produced domestically. Exports have been used to pay for imports, not to stimulate economic growth.

Soviet trade has also been limited by external political factors. Shortly after World War II, the Western allies, led by the United States, virtually embargoed trade with the Soviet Union until the early 1960's. Since that time, the U.S.S.R. has normalized political and economic relations with Western Europe and, to a lesser extent, the United States.

Over the last decade or so, the U.S.S.R. has confronted a number of factors which may require Soviet policymakers to give trade higher priority. For example, the Soviet Union finds itself falling further and further behind most Western industrialized countries in technology achievements. The U.S.S.R. also faces a world economy which has become increasingly interdependent but from which it has remained isolated.

The six papers in this chapter review Soviet foreign economic relations over the last three years and examine what we know so far about Gorbachev's plans for this area. Joan McIntyre's paper on Soviet trade reform gives a broad perspective on the problems that Gorbachev faces in the trade area and steps his leadership has taken so far to come to grips with these problems. Her paper on Soviet hard currency trade and payments reviews the trends in this important sector and the outlook for the remainder of the decade. The other four papers look at Soviet foreign economic rela-

*Analyst in International Trade and Finance, Economics Division, Congressional Research Service.

tions from regional perspectives. Gary Bertsch and Hertha Heiss examine U.S.-Soviet commercial relations. The contributions of Carol Fogarty and Kevin Tritle and of Marie Lavigne look at the Soviet economic ties with the less-developed countries.

This overview considers these papers in the context of five questions: What problems does Gorbachev face in the foreign trade area? What role will foreign trade play in Gorbachev's plans for the Soviet economy? What steps has the new leadership taken to resolve these difficulties? Will the trade reforms improve the Soviet trade picture? Is the geographical distribution of Soviet trade likely to change?

What role will foreign economic relations have in Gorbachev's economic plans?

Soviet leaders have traditionally revealed little about foreign trade plans in their pronouncements. Gorbachev's team apparently is living up to this tradition. But McIntyre has unveiled some clues which point to an increased role for trade. For example, Gorbachev has emphasized that the U.S.S.R. must be able to develop those technologies which have propelled economic growth in the West: machine tools, robotics, microelectronics, computers, and telecommunications. In addition, Gorbachev's economic goals, especially in the machine-building sector, implicitly point to a need for increased imports.

What problems does the Gorbachev leadership face in Soviet Foreign trade?

If trade will have a greater role in Soviet economic plans, the leadership must confront a number of deficiencies. The quality of Soviet manufactured goods lags behind that of Western products and products from newly industrializing countries, and therefore, are not competitive in most foreign markets. As McIntyre points out, Soviet exports, particularly to Western countries, are heavily concentrated in raw materials, especially energy, because manufactured exports suffer from poor quality and out-of-date technology. McIntyre indicates that energy has actually accounted for increasing shares of Soviet hard currency exports, during the last few years, while Western demand for Soviet manufactured goods has been decreasing. As Lavigne points out, Soviet success in manufactured goods exports has been confined to developing countries, where machinery products make up to 50 percent of total Soviet exports.

On the import side, the Soviet Union has suffered disappointments in integrating Western machinery, equipment and technology into its production processes, according to McIntyre. In addition, Soviet hard currency reserves for imports have been limited by prevailing low prices in energy, the Soviet Union's chief source of hard currency.

The Gorbachev leadership also inherited a foreign trade structure which impedes trade expansion. The Ministry of Foreign Trade has had virtually total control over foreign trade transactions. McIntyre's paper on Soviet trade reform describes how this structure stifles direct contacts between Soviet importers and foreign suppliers and between Soviet producers and foreign customers. As a whole, the Soviet centrally planned structure provides few incentives for export production.

What steps has the Gorbachev leadership taken so far to improve the Soviet trade position?

In September 1986, the Soviet government announced a major reform in the foreign trade structure. Since January 1, 1987, according to McIntyre, more than 20 ministries and 70 large associations and enterprises have had the authority to conduct their foreign trade directly through foreign trade organizations (FTOs) under their control. The Soviet decree also gives more importance to exporting by stipulating that hard currency allocations for imports for the ministries and other business operations must come from the sale of their finished products.

McIntyre also describes the Soviet government's new guidelines for foreign equity participation in joint ventures, a major revision of Soviet economic policy. Previously, foreign participation in Soviet business activities was confined to supplying machinery, technology, and management training, with total Soviet control over the end operation, according to McIntyre. Foreigners have shown some interest in the Soviet initiatives. Heiss points out that as of December 1986, seven American companies signed preliminary letters of intent to form joint ventures and 15 more proposals were under discussion.

The Gorbachev leadership has shown other signs of greater Soviet participation in the international economy. According to McIntyre, the Soviets have been exploring the possibility of participating in the General Agreement on Tariffs and Trade (GATT) and have expanded their activities in international financial markets.

How will these measures affect Soviet foreign trade performance in the immediate future?

The trade reorganization may improve the efficiency of Soviet foreign trade operations by reducing the role of the Ministry of Foreign Trade and permitting direct contact between Soviet economic entities and their foreign clients. But McIntyre believes these changes are not likely to improve the Soviet Union's ability to export manufactured goods or to improve its ability to use Western technology—two major weaknesses of the Soviet economy. Such improvements will only come from reforms which provide greater incentives for producers, change the price structure, and improve the Soviet technological base, according to McIntyre. With little improvement in the structure of Soviet trade, foreign trade will likely remain a small part of overall Soviet economic activity and the U.S.S.R. will continue to be isolated from the rest of the world economy.

Will the geographical distribution of Soviet trade change significantly in the foreseeable future?

The authors of the six papers in this chapter seem to conclude that the geographical structure of Soviet foreign trade will change little.

Trade has traditionally taken a back seat to arms control, human rights, and other issues in U.S.-Soviet relations. When progress is being made in these other areas, trade volumes have tended to go up. Tensions between the two countries have led to decrease in bilateral trade. Consequently, U.S.-Soviet trade has accounted for only a small portion of each country's total trade, less than 2 percent, according to Heiss. Bertsch points out that the

basic inclination of U.S. policy has been anti-trade towards the Soviet Union because of the anti-Communist values in American political culture. When U.S.-Soviet relations are in crisis, U.S. Policymakers have used trade controls to put pressure on the Soviet Union.

Heiss's contribution shows that the Reagan Administration used trade for foreign policy objectives against the Soviet Union in December 1981 when it tightened controls on oil and gas equipment exports to the Soviet Union after the imposition of martial law in Poland. As a result, U.S. exports of nonagricultural products dropped in the early Reagan years.

But while the anti-trade forces remain strong in the United States, Bertsch indicates another group supporting trade with the Soviet Union has emerged. This group believes that trade can help reduce tensions between the United States and the Soviet Union and claims that U.S. export controls impose an economic cost on the United States which outweighs any foreign policy benefit. This point of view has made itself felt in U.S. policy recently, which has led to an improvement in the U.S.-Soviet trade environment. Heiss shows that in June 1984, the U.S. agreed to renew the Economic, Industrial and Technical Cooperation Agreement (EITCA) with the Soviet Union for ten years. The EITCA is the only bilateral pact which sets guidelines for promoting bilateral commercial relations between the two countries and its renewal signified the Reagan Administration's desire to maintain the official framework for trade. In addition, Heiss points out that in May 1986 the United States and the U.S.S.R. convened a meeting of their Joint Commercial Commission, the first such meeting in 6½ years, to discuss ways to facilitate trade.

But despite these positive steps, trade between the Soviet Union and the United States will likely remain small for the foreseeable future. According to Bertsch, the power of the anti-trade forces in the United States will likely remain strong. He claims that normalized trade relations, including most-favored-nation treatment for the U.S.S.R., appears unlikely, because of the strong anti-trade bias.

Similarly, data that Lavigne presents indicate no major shift in Soviet Trade with the less developed countries (LDCs). The Soviet Union is seeking a deep restructuring of its exports to these countries with more emphasis on value-added manufactured goods and less on raw materials. Fogarty and Tritle point out that, despite hard currency constraints, the Gorbachev leadership has maintained previous levels of commitments to LDCs through economic aid.

McIntyre indicates that, overall, the geographic distribution of Soviet foreign trade will not change significantly. She states that the Soviets expect their increased imports of higher quality machinery and equipment to come from Eastern Europe. Soviet disappointments with Western technology and equipment and hard currency constraints from low energy prices suggest that Eastern Europe will continue as the Soviet Union's major trading partner group.

U.S. POLICY GOVERNING ECONOMIC AND TECHNOLOGICAL RELATIONS WITH THE USSR

By Gary K. Bertsch*

CONTENTS

	Page
I. Summary.....	433
II. Major features of American policy in historical perspective.....	434
III. Dominant considerations defining current U.S. policy.....	437
National security considerations.....	437
Foreign policy considerations.....	439
Economic considerations.....	441
Implications.....	443
IV. Policy consequences.....	443
Recent policy.....	444
Future policy.....	446

I. SUMMARY

U.S. policy governing economic and technological relations with the USSR is created within a complex and volatile environment. Many factors, including past policy, current superpower relations, and domestic politics can and do affect U.S. policy. This chapter (1) briefly outlines the major features of U.S. policy in their historical context; (2) examines recent U.S. thinking and developments as they impact upon current and future policies governing economic and technological relations with the USSR; and (3) considers the impact of these and related factors and what they suggest for current and future policies.

There are, of course, many significant factors that influence American policy and broader U.S.-Soviet economic and technological relations—e.g., developments in the world economy, Soviet economic and foreign trade policy, and so forth. However, since these and other important factors have been addressed in other contributions to this volume, this essay emphasizes the American politics and policies governing economic and technological relations with the USSR. The basic argument is that U.S. domestic support for such relations with the USSR has always been weak and vulnerable. Although there have been and continue to be some groups in support of expanded and normalized economic relations with the USSR, the power of the antitrade forces has always been strong and is likely to remain so in the absence of a radical reordering of America's priorities and political culture governing its relations with the USSR.

*Codirector, Center for East-West Trade Policy, University of Georgia.

II. MAJOR FEATURES OF AMERICAN POLICY IN HISTORICAL PERSPECTIVE

It is broadly accepted in the policy sciences that the major determinant of present and future policy is past policy. Certainly, past U.S. policies governing trade with the Soviet Union weigh heavily on what the U.S. is doing today and will do in the future.

In the aftermath of the Bolshevik Revolution, U.S. governmental leaders and the majority of business representatives agreed that the U.S. should avoid establishing either diplomatic or formal economic relations with the new Soviet regime. However, even in the absence of the support and protection normally provided by the U.S. government for commercial relations with foreign countries, some American businessmen like Alexander Grumberg, Armand Hammer, and W. Averell Harriman worked successfully with the Soviet government to expand U.S.-Soviet trade. In fact, the U.S. became a major exporter to the USSR through most of the 1920's and 1930's and led the world in exports to the world's first Communist state during many of these years.

However, the U.S. government clung to its position of nonrecognition until 1933 when President Roosevelt moved to accord diplomatic recognition to the USSR. The United States also sought to invigorate the economic relationship by removing many previous restrictions. However, political differences between the two countries, and continuing opposition to trade with the Communists within the U.S. political system, precluded a genuine normalization and expansion of commercial relations. Ideological barriers continued to divide the two countries, and most Americans, including many in the business sector, remained skeptical about the political, economic, and moral advisability of trade with the Soviet Union.

World War II and the Nazi invasion of Russia opened a new era in U.S.-Soviet economic relations, the most significant element of which was the U.S. granting of lend-lease aid to the Soviet Union in 1941. Again, however, the U.S. program of lend-lease assistance reflected earlier patterns including divisive factions within the U.S. political system, and, continuing distrust between the two countries. Interstate mistrust and suspicions meant that the aid was given and accepted grudgingly. And, while some in the United States spoke glowingly of the many good reasons for aiding America's suffering wartime ally, others expressed deep reservations about the advisability of assisting the Stalinists and their repressive Communist state. These interstate and domestic differences carried on through the war and into the postwar era.

With the rapid deterioration of U.S.-Soviet relations in the late 1940's and early 1950's, the rise of antitrade forces within the American system, and the self-imposed economic isolation of the Soviet Union, U.S.-Soviet trade relations took a significant turn for the worse. It was during this period that the U.S. Congress passed new restrictive trade legislation like the Export Control Act of 1949, which restricted exports thought to contribute to Soviet military or civilian economic performance, and the Trade Agreement Extension Act, which withdrew Most Favored Nation (MFN) treatment from the USSR and all East European countries except Yugoslavia in 1951. Tariffs were high, trade facilities and credits were

restricted, and export controls were tight. The primary goal of American policy was to deny the Soviet Union the benefits of trade with the West. During the ensuing Cold War period of economic warfare, U.S. policy was clearly antitrade and most Americans supported it.

What appeared to some to be a Cold War consensus surrounding economic warfare was, however, relatively short-lived. First to challenge the consensus were America's European allies, who in the mid-1950's, began to chafe under the Western embargo and sought to expand their economic relations with the Soviet Union and their traditional East European trading partners. The embargo policy also weakened in the United States as American business and some of its representatives came to recognize and calculate the costs of lost markets in the East. By the 1960's, the Cold War consensus began to wane, and more protrade attitudes, actions, and policies started to emerge in the U.S. political system. For example, in 1964 the United States decided to sell large quantities of grain to the Soviet Union. In the mid-1960's, more business representatives, government officials, and Congressmen came to speak in favor of expanding East-West trade. In 1969 the U.S. Congress replaced the embargo oriented Export Control Act with the more trade oriented Export Administration Act. In 1972 President Richard Nixon went to Moscow to sign agreements and undertake initiatives designed to significantly expand U.S.-Soviet economic and technological relations.

For a short time in the early 1970's, it appeared that a significant change was taking place in American policy. There were signs that a new protrade movement was growing and that "economic detente" might replace the economic warfare of the past. The protrade signs and initiatives were short-lived, however, and the traditional opposition to expanded and increasingly free trade with the Soviet Union mobilized to express the historical antitrade perspectives deeply embedded in American political culture. Senator "Scoop" Jackson and others in the U.S. Congress imposed strict conditions on the extension of MFN status and credit arrangements with the USSR. The anti-Soviet character of American political culture regarding economic and technological relations was still present. However, something important changed in the early 1970's. The protrade forces in the American political process became more organized, disallowing an easy return to economic warfare. The American politics of East-West economic and technological relations became more pluralistic and reflected a growing cast of pro and antitrade forces.

This increasingly pluralistic (i.e., multiple and competing centers of power) and complex political environment was clearly expressed during the Carter Administration. On the one hand, there were centers of power in Congress and the Executive branch working to promote U.S. exports by attempting to remove unwarranted trade barriers and increase federal trade incentives. These protrade centers and initiatives influenced, among other things, Congressional and Executive efforts to revise and update the major piece of East-West trade legislation, resulting in a more trade oriented Export Administration Act (EAA) of 1979. At the same time, there were some in Congress and the Executive branch who were more dis-

posed toward a restrictive point of view. An important variant of this more restrictive approach involved linking trade to Soviet foreign and domestic policy. Many in the U.S. Congress, for example, continued to feel strongly about linking MFN to Soviet human rights practices. In addition, key members of the Carter Administration argued in favor of a policy of "conditioned flexibility" and "economic diplomacy" whereby the U.S. government might use trade restrictions to influence Soviet behavior at home and abroad. For example, in July of 1978, the U.S. government denied an export license for a Sperry Univac computer ordered by Tass to protest the Soviet treatment of dissidents, the arrest of a U.S. businessman, and the trial of two American reporters. Then, in 1980, President Carter invoked a panoply of economic sanctions to protest the Soviet Union's invasion of Afghanistan. Although all Americans deplored the Soviet invasion, all did not support the President's economic responses. There were many inside and outside of American government who disagreed with both the design and implementation of the sanctions. The Carter policies—ranging from the grain embargo to tightened technology controls—set off an intense debate within the United States and Western Alliance. The debate and division over the proper course of American policy continues through the present.

President Reagan's early initiatives concerning U.S.-Soviet economic and technological relations reflected the competing perspectives and centers of power at work in the U.S. system. Early on in his first term, for example, the President honored his campaign pledge to drop the grain embargo while simultaneously moving to tighten up on industrial and technological trade. Although representing both pro and antitrade constituencies, the President's policies leaned decidedly toward the latter, as we will see in the following pages.

This brief historical overview should point out at least three important features of American political culture and political life as they affect U.S. economic and technological relations with the USSR. First, because of the anti-Communist values in American political culture, the basic inclination of U.S. policy toward the Soviet Union has been antitrade. Second, however, because of the pluralistic nature of American political life, and the fading Cold War consensus concerning how the U.S. should deal with the Soviet Union, there has been over the last two decades a lively diversity of thought and competing centers of power relating to the making of American policy. Third, U.S.-Soviet economic and technological relations are politically driven. Therefore, when U.S. relations with the Soviet Union deteriorate, as they did in the late 1970's and early 1980's, it is relatively easy for the antitrade centers to mobilize American public opinion and the broader U.S. political system to oppose commercial and technological relations with the USSR.

Furthermore, within a conflictual and confrontational East-West environment, there is a clear ranking of priorities within the U.S. political system when it comes to the question of economic and technological relations with Soviet Union: that is, national security considerations come first; then come those concerning the foreign policy consequences of trade and technological relations; finally,

coming a distant third are those considerations that involve the economic costs and benefits of the relationship. It is to these considerations, and the developments and policies that surround them, that we now turn.

III. DOMINANT CONSIDERATIONS DEFINING CURRENT U.S. POLICY

Political pluralism is the hallmark describing the American politics of U.S.-Soviet economic and technological relations in the current era. Individuals associated with competing centers of power often hold starkly different opinions about the costs and benefits of such relations with the USSR.¹

NATIONAL SECURITY CONSIDERATIONS

Assessments and opinions about the national security costs and benefits of U.S.-Soviet economic and technological relations vary enormously in the United States. Not only is there considerable difference of opinion about the national security consequences, but there are even greater differences concerning the implications of these consequences in view of the economic and foreign policy costs and benefits to be described in the sections to follow.

Briefly, my interviews reveal that there are many who firmly believe that the U.S. and West are "selling the rope" and that both sales and illegally acquired technology are contributing significantly to Soviet military capabilities. There are others who argue that while the Soviet Union is able to buy and steal some U.S. and Western technology with military application, the contribution to Soviet military capabilities is negligible. And there are even a few who suggest that the U.S. ought to sell the Soviet Union almost anything they want to buy and then reinvest the profits in Western R&D, and thereby, compete most effectively with the Soviets economically, technologically, and strategically.

The key centers of power arguing in the 1980s that Western technology has been making significant contributions to Soviet military capabilities are the U.S. Department of Defense (DOD), the Central Intelligence Agency (CIA), and the Reagan White House. Secretary of Defense Caspar Weinberger, Assistant Secretary Richard Perle, and others have achieved considerable success in raising the level of concern of the American public about the security costs of U.S.-Soviet and East-West technology transfers. These individuals and the offices and interests they represent successfully utilized a number of fora for presenting their case, not the least of which were publications of the DOD and CIA. The DOD series on *Soviet Military Power* has repeatedly called attention to the contributions of Western technology. The initial 1981 edition devoted an entire section to the Soviets' quest for technological superiority and called attention to the shrinking gap in Western technological leadership.^{1b} The 1984 edition referred to an analysis of 800 militarily-relevant cases of technology transfer.² The 1986 report

¹ This section is based upon a series of ongoing interviews over the last decade with representatives of the different centers of power.

^{1b} *Soviet Military Capabilities* (Washington, D.C.: USGPO, 1981), pp. 71-81.

² *Soviet Military Power*, 3rd ed. (1984), p. 108.

claimed that "virtually all of the 5,000 ongoing Soviet research projects with military applications or implications have benefitted to some extent from know-how acquired from the Free World."³ The report goes on to note that "about half of the 6,000 to 10,000 pieces of hardware and one-fifth of the 100,000 documents obtained each year are used by the Soviets in transferring Free World technology to military research projects."⁴ The report provides further support for its case, noting that during the 10th Five Year Plan, "two prime users of acquired technologies, the Ministries of Defense Industry (armor and electro-optics) and Aviation Industry estimated that they had saved almost one-half billion rubles in research project costs translating to over 100,000 man-years of scientific research."⁵

The CIA reports on the *Soviet Acquisition of Militarily Significant Western Technology* overlapped with and supported the DOD reports.⁶ Interestingly, the 1985 update provided a more detailed account of both Soviet organizational arrangements and the examples and figures describing Soviet acquisition efforts. In the mid-1980's, it was learned that much of this information was passed to the French by a senior KGB official between the Spring of 1981 and late 1982.⁷ This information included Soviet plans and reports on the clandestine acquisition and use of Western technology. Those who have inspected the documents consider them to be genuine and to lend support to at least some of the claims of the DOD, CIA, and others calling attention to Soviet acquisitions and their contributions to military capabilities.⁸

On the basis of what they considered to be the growing evidence, and on the basis of their earlier assessments and viewpoints, the key actors in the DOD and from other quarters in the executive branch moved to restrict more fully and effectively the Soviet Union's access to U.S. and Western technology. Included here were efforts to tighten national security controls within the Export Administration Act; strengthen and expand the role of COCOM, the multilateral control system; and, enlarge the role of the DOD by establishing the Defense Technology Security Administration and pursuing an aggressive "Technology Security Program."⁹ In addition, the executive branch established a number of programs, and pursued a number of strategies to limit Soviet access to U.S. and Western technology.¹⁰

For the most part, these strategies and programs were well received in the United States. Given the character of American political culture concerning economic relations with the Soviet Union,

³ *Soviet Military Power*. 5th ed. (1986), p. 108.

⁴ *Ibid.*, p. 108.

⁵ *Ibid.*, p. 108-109.

⁶ *Soviet Acquisition of Western Technology* (Washington, D.C., CIA, 1982) and *Soviet Acquisition of Militarily Significant Western Technology: An Update* (1985).

⁷ First reported in *Financial Times*, March 30, 1985, and *Le Monde*, March 29 and April 2, 1985. Later reported in book form by Thierry Wolton, *Le KGB en France* (Paris: Grasset, 1986).

⁸ See, for example, Philip Hanson, "Soviet Industrial Espionage: Some New Information," (London: Royal Institute of International Affairs, forthcoming 1987); (a working paper of the Chatham House Soviet Foreign Policy Project).

⁹ See, for example, Caspar W. Weinberger, *The Technology Security Program: A Report to the 99th Congress* (Washington, D.C.: Department of Defense, 1986).

¹⁰ See, for example, the previous DOD reports to Congress concerning technology security and other executive branch reports, such as: *Commerce Enforcement of U.S. Export Controls: The Challenge and the Response* (Washington, D.C.: Department of Commerce, 1985).

and the worsening of U.S.-Soviet political relations in the early 1980's, the procontrol, antitrade centers of power were clearly in the ascendancy. However, this did not result in an overwhelming political consensus in favor of greater controls and in opposition to U.S.-Soviet economic and technological relations. First, there were some who were not persuaded that the Soviets were getting as much as was being claimed, and not persuaded that they were benefitting as much as some of the claims would have them imagine. Citing the widely known predispositions of those who were making the assertions and pushing the technology security programs, some in government, business, and academia were reluctant to accept the claims at face value. Also, citing the considerable research that suggests the Soviets and their East European allies have considerable difficulties assimilating and diffusing Western technology, many believed the United States and West had less to worry about than the DOD and CIA would have them believe.

Second, while most everyone agreed that there were some national security costs involved, many argued that these costs had to be viewed alongside the possible economic and foreign policy benefits. They argued that technology security is an important consideration but cautioned that, taken to extremes, it could result in unanticipated costs that outweighed the benefits of economic relations. For example, if the United States were to become excessively control oriented, they argued, it would irritate both allies and adversaries alike and forsake the positive influence that American economic and technological leadership might provide. Some also argued that excessive controls might impact significantly upon American economic interests and have costly consequences for U.S. trade and technological performance in the international marketplace.

FOREIGN POLICY CONSIDERATIONS

U.S. policies governing economic and technological relations are also influenced by competing viewpoints concerning their impact on Soviet foreign policy and U.S.-Soviet relations. Many Americans, including policy makers and the mass public alike, are having a difficult time deciding if commercial and technological relations will encourage more responsible or more aggressive Soviet behavior. Furthermore, should the United States use these relations as a "carrot" or a "stick" to influence Soviet policy, or should it conclude that there is no relationship, and therefore, should be no linkage, between economic and foreign relationships?

There have always been differing viewpoints on these issues in the American political system.¹¹ Considerable controversy was generated in the 1970s when Senator Jackson and the U.S. Congress first moved to place pressure on the Soviet Union by linking MFN to Soviet emigration policies. Later, the Carter Administration pursued, to some extent, a policy of "economic diplomacy" by withholding and granting trade concessions in an attempt to influence both Soviet domestic and foreign policies. More recently, the

¹¹ Gary Bertsch, "U.S.-Soviet Trade: The Question of Leverage," *Survey*, 25 (Spring, 1980), pp. 66-80.

Reagan administration has made it clear that trade concessions will be linked to Soviet human rights, emigration, and defense policies.

Some in the Reagan Administration were clearly inclined toward using the "stick," that is, toward pursuing "negative sanctions" to influence Soviet policies. In 1983 it was reported that NSC staff member Richard Pipes was behind National Security Decision Directive 75, an attempt to influence internal policies of the Soviet Union through trade and economic pressures.¹² Administration officials reported that pressures called for in the directive were intended to force the Soviet leadership, among other things, to confront the difficult choices between civilian and military spending. The logic behind negative sanctions, which many Americans support, is to use U.S. leverage to force the Soviet leadership to make desired changes.

There have been other variants of this approach during the 1980s. Some officials in the Reagan Administration have suggested that the United States will consider certain changes in its restrictive policies if the Soviet Union will first undertake changes in its domestic policies. In the Spring of 1986, Secretary of Commerce Malcolm Baldrige suggested that the United States might lift export restrictions on sensitive petroleum drilling and exploration equipment if the Soviet Union liberalized its stand on emigration and human rights.¹³ Calling the release of Anatoly Shchiransky "a good start," he indicated in 1986 that more would be required before changes in U.S. policy would take place. However, on January 15, 1987, Secretary Baldrige said that despite his continuing dissatisfaction with Soviet human rights efforts, it was no longer in the U.S. national interest to keep the unilateral foreign policy controls on exports of oil and gas equipment and technology.

In the Spring of 1986 the National Conference on Soviet Jewry displayed another variant by suggesting a "step by step" easing of U.S. trade restrictions on the Soviet Union if the USSR began to relax curbs on Jewish emigration.¹⁴ While supporting the Jackson-Vanik amendment intended to place pressure on the Soviet Union, they hold open the possibilities for expanded trade if the Kremlin changes its policies.

Another form of leverage that some Americans and centers of power in the U.S. system support involves that of "positive sanctions." They contend that the power of the carrot is much stronger than the stick. Groups like the American Committee on U.S.-Soviet Relations, and individuals like Donald Kendall and Robert Schmidt, for example, feel that trade can do much to improve the superpower relationship; it can be an incentive to encourage more cooperative Soviet behavior, if it is simply given a chance. They argue that if the United States would grant the Soviet Union MFN status, and if it would loosen unnecessarily restrictive export controls, it would provide incentives for improved behavior on the part of the Soviets.

¹² Based upon interview data. Also, see *Los Angeles Times*, March 16, 1983.

¹³ *Washington Post*, February 20, 1986.

¹⁴ *New York Times*, May 25, 1986.

Senator Robert Dole hinted at such an approach in remarks before a forum on U.S.-Soviet trade relations in the Spring of 1986. Senator Dole noted that while the political benefits of trade with the Soviet Union are unclear, it is evident that the Soviets need and want certain things from the United States and may be willing to make political concessions to get them.¹⁵ He cited the Soviet interest in participating in GATT and their interest in MFN treatment as opportunities for influence that should not be ignored. Dole went on to suggest that one approach would be to suspend the Jackson-Vanik amendment as applied to the Soviet Union for one year: "See what happens. If the Soviets loosen up on emigration, extend the suspension for another year, and so forth. This may get us out of the circular deadlock we are now in . . ." ¹⁶

Others remain very much opposed to using the "carrot" with the Soviet Union. They note the experience of the 1970's to argue that although the United States and its Western allies liberalized and expanded relations with the Soviets in line with the policy of détente, this did nothing to improve Soviet behavior. They cite the clamp down on Jewish emigration and human rights activists, and the Soviet invasion of Afghanistan and complicity in the Polish crisis, as evidence that positive sanctions and carrots do not work. One U.S. Senator was led to conclude on the floor of the Senate that the transfer of Western goods and technology creates a Frankenstein monster that threatens peace throughout the world.¹⁷

David Baldwin's fine book on economic statecraft calls attention to the considerable division and confusion in America, even among its leading scholars, about the use of economic relations for the purpose of foreign policy.¹⁸ Given the confusion and conflicting points of view, the debate surrounding American policy goes on.

ECONOMIC CONSIDERATIONS

There are also differing viewpoints and competing centers of power when it comes to the economic costs and benefits of U.S.-Soviet commercial and technological relations. Some, particularly in the DOD, continue to feel that the benefits are lopsidedly distributed in the Soviets' favor. Others, particularly in the American export community, feel that there are significant economic benefits for the United States and that U.S.-Soviet commercial relations can be an area of mutual economic benefit. Many feel that under current policy, the United States is foregoing sizable economic benefits (that go increasingly to America's allies), and even more significantly, incurring significant and unanticipated costs.

The most powerful center of power that considers U.S.-Soviet trade and technological relations a major economic cost to the United States and Western Alliance and a benefit to the Soviet Union is the DOD. Caspar Weinberger and Richard Perle, among others, have repeatedly warned U.S. and West European audiences of the significance of these costs. In an effort to quantify them, the

¹⁵ Robert Dole, Remarks at the 1986 Forum on U.S.-Soviet Trade Relations, Washington, D.C., April 24, 1986, p. 5 mimeo.

¹⁶ *Ibid.*, p. 6.

¹⁷ As reported by Congressman Don Bonker, during remarks at the 1986 Forum on U.S.-Soviet Trade Relations, Washington, D.C., April 24, 1986, p. 4 mimeo.

¹⁸ David A. Baldwin, *Economic Statecraft* (Princeton, N.J.: Princeton University Press, 1985).

DOD sponsored a study to assess the effect of trade and technology transfer on the United States and West.¹⁹ Among other things, the study concluded that Western technology saved the Soviets billions of dollars; drastically reduced weapon development time; greatly enhanced industrial productivity; and allowed quick response to Western weapons and tactics. By evaluating a cross-section of export licenses sought by American businesses for exports to the Soviet Union through the U.S. and COCOM licensing systems in 1983-84, the study estimated that the Soviets could have gained between \$6.6 and \$13.3 billion between 1985 and 1997 in primary cost savings if the license applications had been approved. These approvals, in turn, could have cost the United States and its allies \$7.3 to \$14.6 billion. When relating their findings to future defense costs to the West, the DOD estimated that the actual costs are much higher, perhaps \$20-\$50 billion per year.²⁰

Many concerned with U.S. economic and technological performance in the international marketplace see the distribution of costs and benefits differently. Another center of power, American exporters and their supporters in the U.S. Congress, is increasingly concerned about the economic costs of unnecessarily restrictive American national security and foreign policy controls. President Reagan's 1985 Commission on Industrial Competitiveness, for example, claimed that extraordinary, unilateral U.S. export controls were costing the United States over \$11 billion in lost sales annually.²¹ In 1986 a report by the Business-Higher Education Forum called these overly restrictive controls unproductive, counterproductive, and an overreaction to the perceived Soviet military threat.²² While they consider these controls undermining U.S. competition in the Soviet and other communist markets, they note that the principal impact of controls falls on exports to noncommunist countries. They argue that the costs of export controls extend far beyond the revenue that may be foregone if a license for a particular export transaction is denied. Because international trading relationships are guided by a complex set of considerations, including anticipation of future relationships, the uncertainties created by U.S. policy are considerable. The Business-Higher Education Forum and others are calling attention to foreign efforts to "design out" or eliminate U.S. origin parts and components from their products to avoid the risks of future impositions of U.S. export controls.²³ The report concludes that perhaps the most significant and could be significantly cost of all, however, stems from the impact of U.S. controls on technological advance. "To the extent that controls to protect technology also serve to isolate it and curtail its application, the forces that propel innovation are weakened."²⁴ These reports were given further support with the release in 1987 of the National Academy of Sciences (NAS) report entitled "Balancing

¹⁹ *Assessing the Effect of Technology Transfer on U.S./Western Security: A Defense Perspective* (Washington, D.C.: Office of the Undersecretary of Defense for Policy, 1985).

²⁰ *Ibid.*, pp. E1-E6.

²¹ The Report of the President's Commission on Industrial Competitiveness, *Global Competition: The New Reality*, Vol. II (Washington, D.C.: USGPO, 1985), pp. 194, 197.

²² A Report by the Business-Higher Education Forum, *Export Controls: The Need to Balance National Objectives* (Washington, D.C.: Business-Higher Education Forum, 1986), p. 4.

²³ *Ibid.*, pp. 13-14; and *Journal of Commerce*, August 5, 1986.

²⁴ *Ibid.*, p. 15.

the National Interest: U.S. National Security Export Controls and Global Economic Competition."²⁵ The blue ribbon NAS Panel of senior defense, business and scientific authorities recommended that the U.S. reconsider its export control policy and machinery in order to promote trade and technological competitiveness while protecting America's security.

Returning to the costs and benefits associated more specifically with the Soviet market, some argue that while the benefits tied to economic relations with the USSR are certainly smaller than the global costs and benefits noted above, they are not insignificant and could be significantly expanded in the years ahead. James H. Giffen, President of the U.S.-USSR Trade and Economic Council, among others, has suggested that the superpowers could achieve a major expansion in the next five years.²⁶ Others argue that economic benefits are being lost because U.S.-Soviet economic and technological relations are not receiving enough high level political attention and were given "short shrift" by President Reagan and Secretary Gorbachev in the 1985 summit.²⁷ Finally, there are other individuals and centers of power, such as American grain growers and their supporters in Congress, who call attention to the costs of American policy and point out that America has indeed become a supplier of last resort.²⁸ The Soviets' decision in 1986 to reject American offers of 4 million metric tons of subsidized wheat under the export enhancement program is cited as a significant case in point.

IMPLICATIONS

This brief overview of competing views and centers of power concerning the costs and benefits of economic and technological relations with the USSR is only a sampling of the incredibly complex, increasingly pluralistic political environment surrounding these issues in the American system. Because there are so many different interests and points of view; because we still know rather little about the entire range of costs and benefits, and more importantly, their tradeoffs and interrelationships; and, because no viable consensus has emerged that unites the competing centers of power, U.S. policy has been and is likely to continue to be sometimes inconsistent, often unpredictable, and frequently controversial.

IV. POLICY CONSEQUENCES

There are, of course, a host of factors which determine the course of U.S.-Soviet economic and technological relations. This volume and the more specialized section in which this chapter is included concentrate on those factors having to do with Soviet domestic and foreign economic policy. This chapter, in contrast, focuses on the U.S. side. It suggests that American political culture—including deep-seated and continuing suspicions of the Soviet Union—has

²⁵ *Balancing the National Interest: U.S. National Security Export Controls and Global Economic Competition* (Washington, D.C.: National Academy Press, 1987).

²⁶ James H. Giffen, "U.S.-Soviet Trade: Prospects for Expansion," *Journal of the U.S.-USSR Trade and Economic Council*, Vol. II, No. 2 (1986), pp. 20-22.

²⁷ *Journal of Commerce*, November 27, 1985.

²⁸ *International Trade Reporter: U.S. Export Weekly*, Vol. 3, September 17, 1986, p. 1128.

much to do with the course of U.S.-Soviet economic and technological relations. In addition, it suggests that the open and pluralistic nature of American political life, which includes some protrade individuals, groups, and centers of power, also has significant implications for American policy. Finally, it should be emphasized that the state of U.S.-Soviet political relations is a powerful force that can have a significant impact on U.S. policies governing economic and technological relations with the Soviet Union.

RECENT POLICY

American policy in the 1980's has been a complicated consequence of many of the forces touched upon this chapter. It is a result of, among other things, past policy and political culture, contemporary pressures resulting from competing centers of power, and a reaction to global economic and political forces not the least of which are declining American trade and technological performance and the changing superpower relationship. Brief reference to some key aspects of recent American policy will call attention to the impact of these forces.

The economic warfare values emanating from past history and the latent Cold War impulses of American political culture continued to affect and be reflected in U.S. policies in the 1980's. There have been many such examples of U.S. policy including U.S. efforts to expand unilateral and multilateral export controls, the sentiment for tightening the forced labor provisions of the Smoot-Hawley Tariff Act, the continued denial of MFN status to the Soviet Union and extension of it to other Communist countries with poor human rights and emigration records, and continuing restraints on public lending. Elements of economic warfare were clearly evident in these and other examples of recent American policy.

While some important centers of U.S. power in the 1980's reflected economic warfare thinking and worked to restrict U.S.-Soviet economic and technological relations, others sought to facilitate it. In the area of agricultural trade, for example, pragmatic economic interests often transcended political, ideological ones. Due to pressure from American grain growers and their Congressional supporters, for example, the limited embargo was dropped in 1981 and a new Long-Term Grain Agreement (LTA) signed in 1983. This five year LTA was intended to reclaim the American market share and stabilize U.S.-Soviet agricultural trade. In another policy area, a number of significant centers of power in the private sector and Congress sought in the 1980's to liberalize American export controls in order to facilitate U.S.-Soviet trade and restore American credibility worldwide as a reliable supplier. As a result of these protrade forces, the Export Administration Act of 1985 contained a number of relaxations including the stipulation of additional requirements upon the President to consult with Congress before the imposition of new foreign policy controls; the prohibition of foreign policy controls that would break contracts previously entered into except in cases where a "breach of the peace" poses a serious and direct threat to the strategic interest of the United States; and, the termination of U.S. foreign policy controls on items which are

available from foreign sources unless the President can negotiate with foreign governments to end foreign availability.

As U.S.-Soviet political relations began to thaw in 1985, other changes began to occur as well. In May 1985, Secretary of Commerce Baldrige went to Moscow to co-chair the 8th Session of the Joint U.S.-USSR Commercial Commission (a government to government body created in 1972 to facilitate trade), the first such high level meeting since 1978. In a subsequent letter to American business, Secretary Baldrige encouraged U.S. exporters to explore trading opportunities in the USSR, noting that they would find the business climate improved.²⁹ In June 1985 there was the renewal of the U.S.-Soviet Agricultural Cooperative Agreement calling for scientific and technological cooperation through the exchange of information and teams of specialists in 29 different agricultural areas. The environment surrounding U.S.-Soviet economic and technological relations warmed further in November 1985 as a result of the Reagan-Gorbachev summit in Geneva. When asked if the climate of U.S.-Soviet trade relations had changed for the better following the summit, Secretary Baldrige replied: "Yes, it's a different ballgame."³⁰

In December 1985, President Reagan wrote to the participants of the ninth meeting of the U.S.-USSR Trade and Economic Council in Moscow encouraging them "to explore possibilities for increasing trade and commercial exchanges that will benefit the peoples of both countries."³¹ Secretary Baldrige went to the meeting to lend his "support and the support of the U.S. government" to the work of the Council.³² In the summer of 1986, the United States and Soviet Union announced 13 exchange programs in education, science, and culture raising exchanges to their highest levels since the cuts surrounding the imposition of the Afghanistan sanctions in the early 1980's.

In a December 1986 meeting of the Joint Commercial Commission in Washington, D.C., Secretary Baldrige urged the American and Soviet governments to take steady steps to expand U.S.-Soviet trade. In line with his urging, the U.S. government supported the U.S. pavilion at the Soviet food industry show INPRODTORG-MASH in September of 1986, the 1987 pavilion organized by the Department of Housing and Urban Development, and the U.S.-USSR Trade and Economic Council at the Soviet construction exhibition. Other positive steps were taken including the introduction of legislation to end the long-standing embargo on imports of Soviet furskins; attempts to reach an agreement to end the embargo of imports of nickel from the USSR; and, the addition of second commercial officer to the U.S. Commercial Office in Moscow.

In January of 1987 Secretary Baldrige allowed the foreign policy controls on the export of oil and gas equipment to the USSR to expire, and in February announced a number of steps on relaxing export controls in line with President Reagan's competitiveness initiative. Included were efforts to reduce (1) the size of the control

²⁹ *Business America*, June 10, 1985, p. 10.

³⁰ *Journal of commerce*, May 19, 1986.

³¹ See letter in *Journal of the U.S.-USSR Trade and Economic Council*, Vol. II, No. 1 (1986), p. 8.

³² *Ibid.*, p. 11.

list, (2) the unilateral aspects of the control program, and (3) the processing time of licensing. Although these and related trade facilitation initiatives were present in 1987, it would be unwarranted to assume that a new consensus had formed around the idea of expanded economic and technological relations with the USSR.

FUTURE POLICY

Although the future is always cloudy when it comes to U.S.-Soviet economic relations, the likelihood for fully normalized relations in the next half decade—which would include the granting of MFN tariff treatment, governmental credit, and a major relaxation of export controls—appears unlikely. Normalization would require a number of important political preconditions including major breakthroughs on arms control, a code of conduct governing superpower involvement in regional disputes, and greater agreement concerning acceptable human rights conduct.

Also unlikely, but not inconceivable, is movement toward a more restrictive policy. If agreements in the above areas elude the superpowers, and if these and other new areas of confrontation come to the fore, the antitrade forces could spring back into action. Their activity could take a number of forms. Court action on countervailing duties and dumping, and enforcement of the "forced labor" provisions of Smoot-Hawley could further decrease U.S. imports from the Soviet Union. With reduced income from declining oil and gas revenues, further restraints on private lending could tighten commercial bank credits and the Soviets' ability to buy from the United States even further. It is also conceivable that the Long-Term Grain Agreement may not be renewed, allowing Soviet grain imports from the U.S. to fall to even more insignificant levels. Finally, it is not inconceivable that the antitrade forces might engineer another major effort to expand and tighten strategic trade controls. When considering the likelihood of this restrictive scenario, it is important to note that the United States would probably have to "go it alone" since it is highly unlikely that its Western allies would be willing to take similar actions.

Perhaps the most likely policy scenario for the future, then, is a continuation of the past—namely, a combination of restrictive and facilitative impulses reflecting the complex forces in the domestic and international environment. For example, in the areas of U.S. export control policy, there is likely to be domestic debate involving the uncertain issues of "contract sanctity" and "breach of the peace" in the EAA. Will "breach of the peace" conform to narrower conception—i.e., "a serious and dire threat to the strategic interests of the United States"—or will it assume the broader definitions supported in some quarters? Then, concerning the issue of extraterritoriality, there is likely to be more debate on what might be done to further U.S. control objectives while allaying the concerns of the allies which motivate them to avoid dependence on U.S. technology. Although the report of the National Academy of Sciences, Congressional efforts to relax export controls, and private sector support for these initiatives call attention to significant efforts to liberalize U.S. export control policy, one should not expect a dramatic, longterm relaxation of controls on trade and technolog-

ical relations with the USSR in view of the continuing suspicions in American political culture.

There is also likely to be continuing debate and both restrictive and facilitative initiatives involving U.S. import restrictions on commercial relations with the USSR. Although repeal of the Jackson-Vanik amendment is unlikely, there may well be efforts in Congress to relax the restraints through a waiver of the amendment in return for some improvement in Soviet emigration policy. We might also see efforts to tighten and enforce provisions of the 1930 Smoot-Hawley Tariff Act, halting millions of dollars worth of Soviet imports (including petroleum products, gold ore, agricultural machinery, tractor generators, and tea) that are considered to have been made with "forced labor." Finally, there could be further action concerning the application of U.S. countervailing duty law to non-market economy countries.

There will also be continuing debate and the potential for both facilitative and restrictive action on the issues surrounding U.S. credit controls. Some in Congress and the Executive branch continue to be concerned with Western lending to the Soviet bloc. It is interesting to note that in 1985, the Reagan Administration opposed a Senate bill (the Financial Export Control Act) which would have put greater pressure upon America's allies to restrict lending to the Soviet bloc citing, among other things, "capricious political decisions" which may damage the international image of U.S. credit markets, create disputes within the Western alliance, and run counter to the spirit of Geneva." However, in March of 1987 Senator Jake Garn and eight Democratic and Republican cosponsors reintroduced financial export control legislation to grant the President the authority to control the transfer of money and other financial resources to U.S. adversaries. When introducing the legislation, Senator Garn noted that he had received thousands of cards and letters urging that "the United States stop providing money and other financial resources to the Soviet Union." The issue of government credit control, as it affects trade with the Soviet Union and other Communist countries, will continue to be controversial as the U.S. government deals with the problems surrounding declining U.S. trade performance.

The development of an integrated, coherent set of American policies based upon a broad political consensus appears unlikely in the foreseeable future. It will be difficult to forge an antitrade policy of economic and technological warfare because of the protrade centers of power, many of which are increasingly concerned with the U.S.'s declining trade and technological performance in the international marketplace. It will be equally difficult to develop an integrated protrade policy because of the lingering Cold War values of American political culture in an ideologically charged world. Under all scenarios, U.S.-Soviet economic and technological relations are likely to be significantly affected by both U.S. domestic and superpower politics. Accordingly, spasmodic, sometimes inconsistent, and frequently controversial policies may have to be recognized as an unavoidable reality of the contemporary era.

U.S.-SOVIET TRADE TRENDS

By Hertha W. Heiss*

CONTENTS

	Page
Summary	448
I. Status of Bilateral Trade, 1981-86	449
A. Trade Levels, Market Shares, Composition	454
II. Role of Agricultural and Related Exports	459
A. LTA and Grain Trade	459
B. Fertilizer Trade	462
III. Industrial Exports: Cooperation and Trends	463
IV. Imports and Constraints	467
V. Factors Facilitating and Restricting Trade	470
A. Recent U.S. and Soviet Developments	470
B. East-West Agenda	472

TABLES

1. U.S.-U.S.S.R. Trade, 1979-86	454
2. All Items in U.S. Total Exports to Soviet Union, 1981-85	456
3. Leading Items in U.S. Total Exports to Soviet Union in 1981-85	456
4. All Items in U.S. General Imports From Soviet Union, 1981-85	457
5. Leading Items in U.S. General Imports From Soviet Union in 1981-85	458
6. U.S.S.R. Imports of Corn and Wheat, 1979-85	460
7. U.S. Fertilizer Trade With the U.S.S.R.	462

SUMMARY

U.S.-Soviet commercial relations, which were at a low ebb when the first term of the Reagan administration began, continued to decline until 1984. While the Carter agricultural embargo was lifted, government actions to implement a more restrictive philosophy on East-West economic relations were accelerated by the imposition of martial law in Poland. Efforts to interdict the flow of technology, particularly in the field of energy, reached a high point in 1982. In 1984, following a Presidential speech calling for a more constructive working relationship with the Soviet Union, the linkage of trade with Soviet international and domestic conduct was modified from a predominantly punitive function to one that could also contribute positive impulses. The only U.S.-Soviet agreement covering general commercial relations was renewed in 1984 and after a six year hiatus, the two governments resumed a dialogue on trade. Meetings of the cabinet level Joint U.S.-U.S.S.R. Commercial Commission in 1985 and 1986 led to better access to the Soviet market for American firms, a renewal of bilateral efforts to find projects

*Consultant.

suitable for U.S.-Soviet cooperation, and laid the groundwork for lifting the U.S. embargoes on furs and nickel. While there was no movement on fundamental policy issues, including MFN and government credits, both sides took modest steps that improved the trading environment.

Trade flows, which had diminished drastically in 1980 as a result of the Afghanistan sanctions, rebounded between 1982 and 1985, led by American grain sales, which retained their dominant role in U.S. exports. In 1985 and 1986, however, the Soviets for the first time failed to meet their wheat purchase commitments under the long term grain agreement. This not only caused U.S. exports to plummet, but introduced a new element of uncertainty into the longer term outlook for the volume of trade and for the traditional U.S. trade surplus.

U.S.-Soviet exchanges of fertilizers under long-term arrangements became a major component of nonagricultural trade in both directions. Other American imports from the U.S.S.R. remained at a low level, and exports of machinery and equipment stagnated.

Recent developments that could offer new opportunities for U.S.-Soviet commerce include a renewed emphasis on the role of foreign trade, accompanied by far-reaching Soviet trade reforms that decentralize the trade apparatus and broaden foreign business access to many end users. The reforms also permit, for the first time since the 1920's, Western equity and management participation in joint manufacturing ventures on Soviet territory.

Other factors that may facilitate U.S.-Soviet trade include signs of a moderating trend in export controls and legislation strengthening protection of contract sanctity.

Many old restrictions remain in place and some new ones have emerged. Apparent Soviet determination to narrow its trade gap with the United States as part of its drive to conserve hard currency could lead to a continuing curtailment of its grain purchases and limit opportunities for expanded industrial exports outside two-way trade arrangements and joint ventures. Finally, any substantial normalization and growth in trade ties will depend on a comprehensive improvement in superpower relations.

I. STATUS OF BILATERAL TRADE, 1981-86

Mutual trade does not loom large overall in the economies of the Soviet Union or the United States, since it represents less than two percent of each country's global commerce. A principal assumption underlying U.S. Government support for the development of U.S.-Soviet trade from 1971 to 1980 was that better economic, scientific and cultural relations might help bring about more desirable Soviet international conduct and more liberal domestic policies. Closer ties, it was thought, would provide the United States with the opportunity to prod the U.S.S.R. by employing economic measures representing either incentives or penalties.

By contrast, the Reagan administration's philosophy was shaped by the view that detente had been "a period of unprecedented growth of the Soviet military coupled with increased adventurism

worldwide."¹ The administration stressed at the outset and throughout its first term the need to restrict most nonagricultural Western trade and credit flows to the Soviet Union, which it viewed as conferring one-sided benefits by enhancing Soviet resources overall, particularly financial means and technological capabilities. Moreover, substantial trade relations were seen as affording the Soviet Union undue and potentially damaging "reverse leverage" over its Western suppliers, creditors and energy customers.

Export Restrictions Tightened

While lifting the export embargo on grains, feed and livestock products and fertilizer in April 1981 in line with a Reagan election campaign pledge, the administration pressed ahead with the development of a more restrictive "prudent approach" to other aspects of East-West economic relations. Originally the administration had left the door open for improvements in trade relations if the U.S.S.R.'s conduct warranted.² But the Soviet role in the imposition of martial law in Poland in December 1981 provided further impetus and justification for the drive to harness trade as a primary means for reinforcing national security and foreign policy objectives, and it led to a climate in which only the punitive aspects of this linkage were applied for almost two years. Additionally, there was in some parts of the administration the notion that trade represented a lever sufficiently powerful to bring about either the "demise" of the Soviet economy and/or wide ranging economic, political and social reforms.

U.S. efforts to restrict exports to the Soviet Union peaked in 1982. The administration, in June, extended the 1981 American embargo on most exports to the U.S.S.R. of oil and gas exploration, production, refining and transmission equipment and technology,³ to foreign-origin products by U.S.-owned or controlled companies and of foreign products based on U.S. technical data regardless of the nationality of the producer. This step was taken on the grounds that it was necessary to: (a) bring about improvements in Poland; and (b) delay construction of the Yamal gas pipeline to Western Europe, which represented a strategic threat. Lastly, this step also reflected the administration's exasperation with the meager results of its campaign to persuade the European allies to impose tighter across-the-board controls on their East-West economic dealings.

When a compromise was worked out with the allies in November 1982 under the umbrella of NATO and OECD, the U.S. Government lifted not only its extraterritorial restrictions, but simultaneously scaled back its controls over American oil and gas equipment as well as technology to the pre-December 1981 level.

¹ Myer Rashish, Under Secretary of State for Economic Affairs, Testimony before Senate Committee on Foreign Affairs, Subcommittee on International Economic Policy, September 16, 1981.

² *Ibid.*

³ For a description of the energy and pipeline sanctions until mid-1982 see J. Brougher, "The United States Uses Trade to Penalize Soviet Aggression and Seeks to Reorder Western Policy", in Congress of the United States, Joint Economic Committee, *Soviet Economy in the 1980's: Problems and Prospects*, Part 2, pp. 419-453, Government Printing Office, December 31, 1982.

Support for Agricultural Trade

This relatively auspicious start in 1983 was followed by cautious signs of support for nonstrategic trade in some parts of the U.S. Government. Thus the Department of Commerce provided assistance for an agricultural equipment show which the private sector U.S.-U.S.S.R. Trade and Economic Council (USTEC) held in Moscow in October 1983. More importantly, a new 5-year Grain Sales Agreement (LTA) was negotiated, which provided for substantial increases in Soviet purchases. Moreover, Agriculture Secretary Block traveled to Moscow for the signing on August 25, 1983 thus becoming the first U.S. cabinet officer to visit the Soviet Union on business since the Afghanistan invasion.

But any prospects for a return to more normal trade relations were cut short, when the Soviet Union shot down KAL flight 007 in September 1983. While the ensuing U.S. sanctions were confined to the transportation sector, the chill produced by this incident set back any possible commercial rapprochement. The Soviets demonstrated their interest in preserving economic ties, when the USTEC annual meeting went forward in Moscow in December 1983 with the participation of high Soviet officials a few days after Brezhnev's death. Then-Soviet Premier Tikhonov on that occasion assured the several hundred U.S. business executives present that the Soviet Union remained interested in mutually beneficial trade with the United States.

Reopening the Dialogue

There had been no official governmental communications on nonagricultural trade for five years, when President Reagan, in January 1984, set forth three major objectives for U.S.-Soviet relations, that laid the foundation for a resumption of a dialogue on commercial relations. One of the three objectives was to build a more constructive working relationship, and the President specifically determined that expansion of peaceful trade, which would benefit both sides, can and should be part of this effort.

Enunciation of this principle provided the justification for keeping the 1974 Agreement on Economic, Industrial and Technical Cooperation (EITCA) ⁴ from lapsing. This agreement, the only U.S.-Soviet pact covering general commercial relations, calls in general terms for the two governments to use their good offices to facilitate commercial cooperation, including purchases and sales of equipment for the construction of new, and the modernization of existing, enterprises, trade in raw and agricultural materials, manufactured goods, in services and licensing. The agreement contains an undertaking by both sides to facilitate the lease of office and residential premises, hiring of staff, issuance of visas and business travel. In the absence of a U.S.-Soviet trade agreement, this bilateral commitment to "business facilitation" has been particularly important for American firms operating in the Soviet Union.

The EITCA also established a Working Group of Experts. That group was to meet once a year to exchange information that would help U.S. firms and Soviet foreign trade entities find areas for in-

⁴ Treaties and Other International Acts Series (TIAS) 7910, U.S. Department of State, 1974.

dustrial cooperation. Following the 10-year extension of the EITCA in June 1984 after considerable interagency struggles, it was decided to reactivate the Experts Group (which had not met since December 1978) as a possible first step toward reopening a dialogue on trade.

Despite their preference for a cabinet-level meeting, the Soviets yielded to the U.S. desire for a lower-key forum. Headed by then-Undersecretary of Commerce for International Trade Olmer, and then-Soviet Deputy Minister of Foreign Trade Sushkov, the Working Group of Experts met in Moscow in January 1985 to discuss the issues each side considered major impediments to an increase in bilateral trade. The group identified steps to remove such obstacles and pinpointed areas where the outlook for expansion appeared promising. Both sides agreed there was sufficient common ground for a productive meeting at the cabinet level.

The Joint Commercial Commission Revived

Accordingly, the Joint U.S.-U.S.S.R. Commercial Commission (JCC) convened on May 20 and 21, 1985 in Moscow, chaired by Commerce Secretary Malcolm Baldrige and then-Soviet Foreign Trade Minister Nikolai Patolichev. This was the first JCC session in over 6 years. Created pursuant to a U.S.-Soviet communique of May 26, 1972,⁵ the JCC had been given the responsibility to monitor the spectrum of U.S.-Soviet commercial relations, and to serve as a forum for airing and promoting the solution of bilateral trade problems. The commission had met seven times prior to the Soviet invasion of Afghanistan, when policy-level (Assistant Secretary and above) economic contacts were suspended. Since its charter is neither tied to specific agreements nor subject to expiration, the JCC was able to resume functioning by mutual agreement. The main purpose of the 8th Session of the Joint Commercial Commission was to reopen the channels for regular high-level U.S.-Soviet review of bilateral trade issues. The major practical U.S. objective was to improve the access of U.S. firms to the Soviet market. This access had deteriorated badly as the U.S.-Soviet climate worsened and the institutional framework for commercial relations, which had served to alleviate such problems in the past, had fallen into disuse. In the aftermath of the Afghanistan and Polish sanctions, U.S. firms were relegated to the role of suppliers of last resort.

Better Market Access, U.S. Support Pledged

At the JCC meeting, the U.S. side was successful in obtaining Soviet agreement to remedy this situation. Minister Patolichev sent a letter to Soviet Foreign Trade Organizations (FTO's) stating that:

all interested U.S. firms would receive bids from FTO's, proposals by U.S. firms were to be considered on their economic merits,

Soviet authorities would end their restrictions on U.S. company seminars at the U.S. Commercial Office (USCO) of the American Embassy in Moscow, and

⁵ Weekly Compilation of Presidential Documents, p. 24, Washington, June 5, 1972.

access of American firms to Soviet foreign trade officials would improve.

The U.S. side responded to the Soviet request for public affirmation of U.S. Government support for peaceful trade with the Soviet Union with a message from Secretary Baldrige to the American business community.⁶ Noting the Soviet pledge to improve their access to the Soviet market, the message offers U.S. Government assistance in their marketing efforts to American firms, while reminding them of the need for compliance with export regulations.

The United States also announced its readiness to initiate a modest trade promotion program. The Commission discussed the U.S. analysis of some 30 projects which the Soviet Ministry of Foreign Trade had identified as having potential for U.S.-Soviet cooperation. Finally, in order to eliminate a long-standing irritant, the U.S. undertook to submit legislation to end the 34-year old embargo on the importation of seven types of Soviet furs.

The Trade Environment Improves

The 18 months following the 8th JCC produced some positive developments. At the Geneva summit in November 1985 trade was not an agenda item, but President Reagan reportedly⁷ expressed his support for the expansion of peaceful trade. General Secretary Gorbachev, at a press conference following the summit, specifically mentioned Soviet readiness to consider joint projects with American firms.

The generally improved atmosphere resulting from the summit, and the concrete steps in fulfillment of the JCC undertakings provided a better environment for U.S.-Soviet trade. American firms reported receiving bids, restoration of access to FTO officials and an increase in contracts signed. In December 1985 Secretary Baldrige traveled to Moscow to address the annual meeting of the U.S.-U.S.S.R. Trade Economic Council. The Department of Commerce resumed trade promotion activities with several sales seminars in USCO. In September 1986, the Department also participated for the first time in seven years in a Soviet trade show with a U.S. pavilion at INPRODTORGMASH (food machinery). The exhibit comprised 60 American companies and was the largest U.S. presence at any trade show abroad in 1986. It was opened by the Under Secretary of Commerce and received high-level Soviet cooperation and attention. American firms reportedly signed \$4 million worth of contracts and projected substantial further sales.

Two bilateral subcommittees (formerly working groups) of the JCC that had been reactivated by the 8th Commission session met in Moscow and in Washington to discuss business facilitation issues and potential projects, respectively.

On the negative side of the ledger, the withdrawal in September 1986 of Soviet nationals from the staff of Embassy Moscow in retaliation for the U.S. cutback of Soviet personnel in the United States has hampered the operations of the U.S. Commercial Office. This

⁶ *Business America*, U.S. Department of Commerce, Vol. 8, No. 12, June 10, 1985, p. 10.

⁷ Honorable Malcolm Baldrige, Remarks to the U.S.-U.S.S.R. Trade and Economic Council, Moscow, December 2, 1985.

has delayed plans for the expansion of trade promotion activities on USCO's premises.

On December 4-5, 1986, Commerce Secretary Baldrige hosted the JCC's 9th Session in Washington with the Soviet delegation headed for the first time by recently appointed Soviet Foreign Trade Minister Boris I. Aristov. They discussed the low level of manufactured goods trade, Soviet failure to meet its wheat purchasing obligations and the dramatic changes taking place in Soviet approach to foreign trade, including the possibility of joint ventures on Soviet soil.

The Commission's main accomplishments were:

agreement in principle to take steps necessary to lift the 3-year ban on U.S. imports of Soviet nickel,

plans to intensify efforts to identify projects with realistic prospects for U.S.-Soviet cooperation.

A. TRADE LEVELS, MARKET SHARES, COMPOSITION

Despite the generally unpropitious U.S.-Soviet relations, the average trade volume between 1981/85 did not decrease drastically compared to 1979, and two basic characteristics of U.S.-Soviet commerce remained unchanged:

Agricultural sales dominated American exports, and total exports continued to exceed imports from the U.S.S.R. by upwards of a factor of five. This meant that the ups and downs in Soviet grain purchases remained the primary determinant of bilateral trade levels. They dwarfed the effect of fluctuations in the volume of imports and non-agricultural exports. In 1986, however, plummeting Soviet wheat purchases introduced a major new element of uncertainty into the outlook for the volume of trade and for the U.S. surplus.

Levels

Bilateral two-way trade had plunged from a postwar high of \$4.5 billion to \$2.0 billion in 1980 as a result of the American restrictions imposed on exports to the U.S.S.R. following its invasion of Afghanistan. By 1984, trade had climbed back to \$3.9 billion, as both grain sales and American imports staged a strong recovery. Since then, however, both U.S. agricultural exports and imports declined by about one third, causing a drop in trade to \$2.9 billion in 1985 and to \$1.9 billion in 1986.

TABLE 1.—U.S.—U.S.S.R. TRADE, 1979–86

	(In millions of dollars)							
	1979	1980	1981	1982	1983	1984	1985	1986
U.S. exports (FAS):								
Total	3,604	1,510	2,339	2,589	2,002	3,283	2,421	1,248
Agricultural	2,855	1,047	1,665	1,855	1,457	2,817	1,864	648
Non-agricultural	749	463	674	734	545	466	558	600
U.S. imports for consumption (CIF): ¹								
Total	873	463	387	248	367	602	441	601
Agricultural	15	10	12	11	11	11	9	16
Non-agricultural	858	452	375	237	356	591	432	585
Gold bullion	549	88	22	4	2	2	1	154

TABLE 1.—U.S.—U.S.S.R. TRADE, 1979–86—Continued

[In millions of dollars]

	1979	1980	1981	1982	1983	1984	1985	1986
U.S.-U.S.S.R. trade turnover	4,477	1,973	2,726	2,837	2,369	3,885	2,863	1,849
U.S. trade balance (+)	2,731	1,047	1,952	2,341	1,635	2,681	1,980	647

^a For years 1974–77 general imports customs value for 1979.

Source: U.S. Census Bureau, U.S. Department of Commerce.

Overall Balance and Market Share

Until 1986, a strong American export surplus continued to characterize the U.S.-Soviet trade balance. Surpluses averaged \$2.2 billion from 1982–85, peaking at \$2.7 billion in 1984—a level second only to the 1979 record. In 1986 the surplus was down to only \$643 million.

From 1983 to 1985, the Soviet Union ranked in the top five (in 1984 it was 2nd) U.S. trade partners in terms of the surplus in the trade balance.⁸ It now appears that a sizable surplus, which had come to be considered a given and major benefit in U.S.-Soviet trade, may not necessarily be taken for granted in the future.

During 1980–84, according to United Nations statistics, the United States accounted for less than 5 percent of Soviet hard-currency trade. American sales during this period represented about 13 percent of the exports of 14 Western industrial countries (IW-14)⁹ and less than 5 percent of those countries' purchases from the Soviet Union.

Composition

Exports

There were no major changes in the product mix of exports to the U.S.S.R. in 1981–85, with food, crude materials, and manufactures including chemicals, making up the bulk of U.S. shipments. (See tables 2 and 3.) Continuing the dominant role evident throughout the 1970's, agricultural sales, led by corn and wheat, averaged over 75 percent of U.S. exports. (Even in 1980, during the partial grain embargo, they had accounted for 69 percent of our exports.) But in 1986, with Soviet grain purchases sharply down, this share sank to 59 percent. Other agricultural products, including soybeans, cotton, inedible tallow, almonds and hides, reached significant levels at various times during 1981–86.

⁸ U.S. Department of Commerce, Office of Trade and Investment Analysis, *1985 U.S. Foreign Trade Highlights*, p. 10, March 1986.

⁹ Leyla Woods, "U.S.-USSR Trade in Perspective", p. 2, Staff Paper, Trade Research Division, Office of Investment Analysis, ITA, U.S. Department of Commerce, August 1986; the IW14 group comprises Austria, Belgium-Luxembourg, Canada, Denmark, France, West Germany, Italy, Japan, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States.

TABLE 2.—ALL ITEMS IN U.S. TOTAL EXPORTS TO SOVIET UNION, 1981-85

[F.a.s. value, in thousands of dollars]

Schedule E No.	Description	1981	1982	1983	1984	1985
0	Food and live animals	1,600,423	1,642,161	1,194,970	2,585,154	1,728,525
1	Beverages and tobacco	400	2,979	954	1,264	8,732
2	Crude materials—inedible, exc	59,350	214,250	264,594	224,263	90,450
3	Mineral fuels, lubricants, etc.	62,840	90,013	22,571	30,045	54,538
4	Oils and fats, animal & vegeta	56,089	40,565	21,506	38,872	63,927
5	Chemicals & related products n	180,223	287,861	239,534	208,151	281,634
6	Manufactured goods by chief ma	32,019	29,110	29,749	17,450	9,587
7	Machinery and transport equipm	301,223	225,788	149,718	110,252	112,106
8	Miscellaneous manufactured art	47,126	59,233	76,815	66,276	71,309
9	Comm & trans not classified el	722	614	2,461	2,205	2,017
	Total of above	2,340,416	2,592,575	2,002,872	3,283,931	2,422,826
	Total exports (no spec cat) to Soviet Union	2,340,416	2,592,575	2,002,872	3,283,931	2,422,826

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note: Trade does not include special category exports.

TABLE 3.—LEADING ITEMS IN U.S. TOTAL EXPORTS TO SOVIET UNION IN 1981-85

[F.A.S. value, in thousands of dollars]

Schedule E No.	Description	1981	1982	1983	1984	1985
044	Corn or maize unmilled	781,677	818,768	390,915	1,389,842	1,502,150
041	Wheat, in split or msin, unmill	772,563	802,182	800,584	1,170,572	158,712
562	Fertilizers & fertilizer matter	0	0	2,925	0	151,730
525	Inorganic chemicals & products	169,125	273,730	223,450	189,052	111,282
057	Fruits & nuts, ex oil nuts—frs	16,003	13,080	2,977	24,518	66,341
263	Cotton	0	67	72,223	167,407	63,577
891	Articles of rubber or plastics	22,171	43,062	60,915	55,635	62,262
411	Animal oils and fats	48,509	17,887	21,506	29,745	36,752
334	Petroleum products—refined	29,785	55,745	19,446	21,867	32,844
744	Mechanical handling equipment	30,947	17,053	5,679	1,888	27,801
423	Fixed veg oils (soft), crude or	1,500	22,678	0	0	27,175
784	Parts of road vehicles & tract	94,602	51,228	33,908	30,245	26,781
233	Rubber—synthetic; & reclaimed	6,224	3,790	12,218	17,156	24,155
335	Resid petro products nspl & re	33,055	34,269	3,125	8,178	21,694
778	Electrical machinery & apparat	5,713	3,680	2,653	2,255	8,270
875	Measuring, checking etc instru	13,181	12,577	12,998	8,472	7,720
723	Civil engineer & contractors	33,592	48,059	28,821	22,828	7,518
121	Tobacco—unmanufactured; tobac	0	1,262	492	946	7,366
598	Miscellaneous chemical product	1,559	6,743	5,415	6,208	5,866
745	Non-electric machy & mechan ap	1,488	2,509	3,784	2,271	5,115
743	Pumps, nspl, compressor, filte	4,830	3,312	4,457	3,818	5,022
774	Electro-medical & radiological	4,584	3,152	4,356	2,512	4,131
591	Pesticides, fungicides & disin	3,004	0	693	1,670	3,900
741	Heating & cooling equipment &	638	1,140	7,040	2,094	3,874
736	Metalworking Mach tools; & pts	19,048	4,915	8,401	1,793	3,795
712	Steam & other vapor power unit	12	1,947	1,946	2,773	3,629
533	Prepared paints, varnishes etc	1,191	2,244	3,478	2,978	3,463
724	Textile & leather working mach	327	664	856	496	2,962
714	Internal combustion engines, n	360	23	17,144	8,830	2,710
728	Specialized industrial machine	18,008	10,721	5,543	6,534	2,480
588	Syn resins; rubber & plastic m	1,176	1,264	1,691	3,053	2,465
657	Special textile fabrics & rel	11,497	805	5,824	37	2,274
727	Food processing machy (exc hou	2,118	245	90	1,997	2,198

TABLE 3.—LEADING ITEMS IN U.S. TOTAL EXPORTS TO SOVIET UNION IN 1981-85—Continued

(F.A.S. value, in thousands of dollars)

Schedule E No.	Description	1981	1982	1983	1984	1985
695	Tools for use in hand or in ma.....	2,519	6,288	1,606	3,101	2,097
651	Textile yarn and thread.....	2,007	969	1,590	0	1,928
	Total of above	2,133,013	2,266,062	1,768,750	3,190,725	2,402,039
	Total exports (no spec cat) to Soviet Union	2,340,416	2,592,575	2,002,872	3,283,931	2,422,826

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note: Trade does not include special category exports.

U.S. manufactured exports constituted the bulk of nonagricultural sales to the U.S.S.R. Between 1980 and 1985 they hovered around \$500 million. The makeup of the category underwent marked changes, as the share of chemicals, mostly fertilizers, rose sharply from 7 to 59 percent at the expense of machinery and transport equipment, which declined from 63 to 24 percent of manufactures exports.¹⁰ The decline occurred primarily in nonelectric machinery, including materials handling equipment and nonagricultural tractors. Tracklaying tractors and parts, previously a major U.S. export item, were caught in the 1981 pipeline restrictions and showed no significant sales until 1986. Pressure sensitive tape, used for wrapping pipe, was not affected and remained a steady seller averaging some \$50 million annually between 1982 and 1985.

Imports

Soviet shipments remained low throughout the 1980's, fluctuating between \$250 and 600 million. They accounted for less than 0.2 percent of U.S. imports and 0.5 percent of Soviet exports during 1982-86. The proportions of the major import categories, i.e. chemicals, metals and petroleum products, varied. (See table 4.) Fertilizers, ammonia and urea, \$118 to 220 million annually, were the leading import during this period. Petroleum product imports were substantial only in 1984-86; platinum group metals ranged from \$38-86 million, while other metals imports declined. Gold bullion became the largest single import in 1986 after a virtual 5 year absence. Agricultural products, mainly furskins, continued to make up less than 5 percent of American purchases from the U.S.S.R. (See table 5.)

TABLE 4.—ALL ITEMS IN U.S. GENERAL IMPORTS FROM SOVIET UNION, 1981-85

(C.i.f. value, in thousands of dollars)

Schedule A No.	Description	1981	1982	1983	1984	1985
0	Food and live animals.....	2,955	5,632	18,078	17,477	12,834
1	Beverages and tobacco	6,072	10,876	21,154	7,839	13,278
2	Crude materials, inedible, exce.....	19,522	10,049	12,098	19,353	15,895
3	Mineral fuels, lubricants, & rel.....	115,913	10,946	59,158	202,563	106,076
4	Oils and fats, animal and vege.....	25	6	1	12	44
5	Chemicals and related products.....	112,839	131,684	160,559	235,029	217,792

¹⁰ *Ibid.*, p. 6.

TABLE 4.—ALL ITEMS IN U.S. GENERAL IMPORTS FROM SOVIET UNION, 1981-85—Continued

[C.I.f. value, in thousands of dollars]

Schedule A No.	Description	1981	1982	1983	1984	1985
6	Manufactured goods by chief ma.....	91,369	61,758	91,202	107,826	64,849
7	Machinery and transport equipm.....	2,677	1,659	3,721	2,874	4,695
8	Miscellaneous mfrd artcls, nsp.....	2,889	9,171	6,295	4,605	3,556
9	Articles not provided for else.....	22,762	5,268	2,402	2,524	3,693
	Total.....	377,022	247,050	374,667	600,104	442,712
	Total, all items imported from Soviet Union.....	377,022	247,050	374,667	600,104	442,712

Source: Compiled from official statistics of the U.S. Department of Commerce.

TABLE 5.—LEADING ITEMS IN U.S. GENERAL IMPORTS FROM SOVIET UNION IN 1981-85

[C.I.f. value, in thousands of dollars]

Schedule A No.	Description	1981	1982	1983	1984	1985
522	Inorganic chem elem, oxids and.....	98,446	100,921	96,784	156,579	131,477
334	Petroleum products.....	115,882	10,946	59,158	202,563	106,873
562	Fertilizers and fertilizer mat.....	0	16,870	48,420	62,748	61,044
681	Silvr, plat, plat gp met unw o.....	50,572	37,961	58,021	85,731	48,981
517	Organic chemicals & related pr.....	509	114	2,123	13,302	21,952
112	Beverages, alcoholic.....	3,973	10,830	21,135	7,838	13,214
036	Shellfish, fresh, frozen, salt.....	674	2,166	16,379	15,695	11,496
212	Furskins, undressed.....	8,627	7,664	8,352	10,248	7,846
288	Nonferrous waste and scrap, ns.....	3,218	0	0	4,892	6,534
641	Paper and paperboard, not cut.....	3,067	3,498	3,589	4,893	5,321
671	Pig iron, etc., and ferroalloy.....	317	0	3,399	3,758	5,000
526	Inorganic chemicals & compound.....	1,220	2,795	2,381	1,905	2,978
896	Artworks, collectors pieces &.....	1,423	7,123	5,733	3,083	2,378
684	Aluminum and alumna alloys, wr.....	671	1,909	504	7,687	2,384
634	Veneers, plywood, wood, worked.....	4,061	1,795	3,903	3,367	1,993
971	Gold, nonmonetary, ex ores & c.....	22,104	4,085	1,693	1,564	1,776
722	Tractors, agricultural and con.....	1,257	49	1,019	909	1,391
931	Special transactions nspf.....	584	1,054	435	485	1,166
037	Fish & shellfish, nspf, prep o.....	1,486	1,408	852	1,193	966
776	Electronic components and part.....	293	380	665	828	767
990	Under \$251 entries, estimated.....	71	75	267	429	729
764	Telecommunications equip nspf.....	2	1	0	11	653
248	Wood, shaped or simply worked.....	0	0	0	28	639
737	Metal-working machinery, nspf.....	207	507	963	26	685
233	Rubber, synthetic, & reclaimed.....	0	11	648	980	442
772	Elect eq, current carry, resis.....	31	7	33	31	365
716	Rotating electric plant and pa.....	2	1	1	17	286
665	Glassware.....	22	14	68	163	273
788	Parts nspf of motor veh & hand.....	236	86	539	108	270
892	Printed matter.....	296	1,388	84	94	265
659	Flr covr, tapestries & arti ve.....	126	92	16	45	227
689	Base met and alloys, wrt or un.....	3,262	924	1,258	317	211
821	Furniture & parts thereof.....	11	29	90	7	190
898	Musical instruments etc & reco.....	52	73	72	57	161
277	Natrl abrasives incl industrial d.....	8	106	130	165	131
	Total.....	322,710	214,880	338,712	591,746	440,194
	Total, all items imported from Soviet Union.....	377,022	247,050	374,667	600,104	442,712

¹ Less than \$500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

II. ROLE OF AGRICULTURAL AND RELATED EXPORTS

A. LTA AND GRAIN TRADE

The significance of agricultural sales for U.S.-Soviet trade can hardly be overstated. Farm exports have been responsible for the substantial American surplus, which has been consistently significant in terms of the overall U.S. trade balance. Moreover, grains have been the only product in bilateral trade where the Soviet Union has accounted for a substantial share of American exports—13 percent in 1982-85—and where the United States has been a major and, at times, the dominant Soviet supplier.¹¹ Since 1975, Soviet purchases of American wheat and corn have been governed by long-term grain sales agreements (LTA's) that established annual floors and ceilings. The 1975-81 LTA obligated the Soviets to buy at least 3 million tons each of corn and wheat, and the United States to permit the sale of another 3 million tons without the need for further consultations. Additional amounts over and above this limit could be and were made available. Between 1981 and 1986, the United States offered a total of 22-23 million tons annually, while Soviet purchases during this period ranged from 6.2 to 18.6 million tons.

In August 1981, after the lifting of the partial grain embargo, and again in August 1982, the Reagan administration extended the validity of the LTA for one year, since the state of overall relations was not conducive to the negotiation of major new agreements. Even so, these extensions raised considerable controversy within the administration as well as public criticism. Annual deliveries of grain recovered partially from the 1980 low of 6 million tons to 9.5 million tons in 1981 and 11.4 million tons in 1982.

In late 1982 and early 1983, the Soviets limited their purchases to the minimum required by the LTA. Against the background of an expanded capacity of competing grain exporters, with some of whom the Soviet Union had concluded long-term supply agreements in 1980/81, this change in Soviet buying behavior raised concerns in the U.S. farm community that the Soviet Union might not purchase any American grain in future years without a new LTA. As pressure was building in Congress, the President announced on April 22, 1983 U.S. willingness to negotiate a new LTA. A new LTA for the period October 1983 to September 1988 was concluded in August 1983. It expanded the range of Soviet purchases by 50 percent, to 9-12 million tons. The Soviets committed themselves to buying 4 million tons each of corn and wheat annually. For the remaining 1 million tons they could buy either cereal or substitute soybeans. An additional 3 million tons of corn or wheat were available to the U.S.S.R. at its option.

With the signing of the LTA, the Soviets resumed their accustomed pattern of purchases from the United States. And despite the chill in relations following the KAL shootdown in September 1983, U.S. grain sales flourished. In 1984, when the Soviet wheat crop suffered extensive damage, the U.S.S.R., taking advantage of

¹¹ For a history of U.S.-Soviet grain trade 1972-82 see A. Byrne, et al. "U.S.-USSR Grain Trade", in Congress of the United States, Joint Economic Committee, *op.cit.*, Part 2, pp. 60-85.

low world prices, greatly increased its grain procurement abroad. The United States was the major beneficiary, with sales reaching a record 18.3 million tons—twice the 1983 level. As a result, the American share of the Soviet market for wheat and corn topped 45 percent, and for corn alone was almost 60 percent.

The resurgence of the United States in the Soviet grain market turned out to be shortlived. While overall Soviet wheat purchases continued to rise in 1985, U.S. sales declined sharply to 1.1 million tons. Another precipitous drop, to 153,000 tons, followed in 1986, despite an estimated small increase in overall Soviet grain import volume. As the end of the 1985/86 agreement year approached, the Department of Agriculture, in early August, authorized a subsidy for exports to the Soviet Union under the Export Enhancement Program. The subsidy was limited to the 3.85 million tons of wheat remaining of the Soviet purchasing obligation for 1985/86 and had a cutoff date of September 30, 1986. The Soviets ignored the offer, which left prices still above the world level and partially coincided with a period of heightened U.S.-Soviet tensions due to the Daniloff affair.

TABLE 6.—U.S.S.R. IMPORTS OF CORN AND WHEAT, 1979–85

(Million metric tons)

	Corn		Wheat	
	Total	United States	Total	United States
1979.....	14.6	12.0	9.6	5.4
1980.....	10.2	4.2	14.9	1.8
1981.....	16.5	5.4	17.3	4.1
1982.....	11.5	7.1	21.1	4.3
1983.....	6.4	3.0	23.0	4.8
1984.....	12.4	10.6	28.0	7.6
1985.....	20.1	13.0	18.7	1.1

Source: U.S. Department of Agriculture, Economic Research Service, including "Embargoes, Surplus Disposal and U.S. Agriculture," pp. 1-13. Washington, USDA, 1986. Byrne, op. cit. (Note 11), p. 64.

The wheat shortfall in 1984/85, which continued into the next agreement year, was the first Soviet breach of the LTA. While Soviet corn purchases were almost four times the 4 million tons required, the terms of the LTA do not permit any substitutions within the required minimum. The Soviets claimed that, because U.S. wheat prices were not competitive, their purchase obligation was void, since the contract specifies purchases "at market prices prevailing." On the other hand, the Soviets also suggested that they fulfilled the pact since they had purchased almost 16 million tons of corn.¹²

The major reason for Soviet underfulfillment of the LTA would appear to be their desire to conserve hard currency, since the lower priced Argentine and heavily subsidized French wheat were the major gainers in the Soviet market share in 1985. The Soviet Union also diversified its sources of corn, so that despite the 23 per-

¹² Statement attributed to Soviet Minister of Foreign Trade B. I. Aristov in "U.S. Soviet Trade Officials Spar", *Washington Post*, December 6, 1986, p. A24.

cent increase in American sales in 1985, the U.S. market share declined again.

Others Sources of Supply

In 1980/81 the Soviet Union had begun to strengthen and expand its multi-year supply arrangements with other countries. In 1986, it renewed grain agreements with Argentina and Canada for another five years. The Argentine agreement calls for 4 million tons of coarse grains annually. The agreement with Canada, mostly a supplier of wheat, sets a 5-year volume of 30 million tons from August 1986-July 1991 without specifying types of grain or annual levels. In addition, the U.S.S.R. can be expected to purchase wheat from Argentina, the European Community (EC) and Australia. The Soviet Union has recently drawn on Thailand, the EC and China for corn or barley. Its new 5-year trade agreement with China provides for Soviet purchases of 7 million tons of corn between 1986 and 1990.

One of the factors in the Soviet shift away from U.S. grain supplies surely was the 1980 embargo. A recent USDA study¹³ found Soviet imports from the United States have not recovered to levels that could have been expected based on trends during the 1970's. It concludes that the embargo probably made the U.S.S.R. more responsive to changes in wheat and corn prices. Thus high American grain prices in recent years, added to the probable lingering resentments over the embargo, played a major role in the diversion of Soviet grain purchases to other sellers.

Soybeans

In 1978/79 the United States supplied 96 percent of Soviet soybean imports. Since the 1980 (total) embargo on soybeans, American sales to the Soviet Union languished, reaching significant levels only in 1982 and 1983. (The United States benefited indirectly from Soviet purchases of soybean meal following the 1980 embargo, since it is a major supplier of soybeans to the Netherlands, a leading exporter of meal to the U.S.S.R.) In 1986 Soviet purchases jumped to 1.5 million tons valued at \$313 million making soybeans the largest single American export to the Soviet Union in that year.

Stagnation in the volume of Soviet soybean imports from 1980 to 1985 was probably attributable largely to limits on Soviet ability to process beans and insufficient storage capacity for meal, as well as shifts in its policy on feed. Recent negotiations with Western firms to build soybean processing plants in the U.S.S.R. point in the direction of higher future soybean imports. This would not, however, automatically guarantee a large U.S. market share, as the Soviet Union has in the meantime undertaken long-term commitments from other sources. Five-year agreements with Argentina (1980-85, 1986-90) call for annual purchases of 400,000 tons, while China is to supply 2.6 million tons over the period 1986-90. Agreements with Brazil (1982-86) provided for annual deliveries of 2.5 million tons of beans and 400,000 tons of meal over a 5-year period.

¹³ U.S. Department of Agriculture, Economic Research Service, *Embargoes, Surplus Disposal and U.S. Agriculture*, pp. 1-16, Washington, 1986.

B. FERTILIZER TRADE

As noted above, fertilizer shipments in both directions have become a major component of U.S.-Soviet trade in the 1980's. This situation has resulted largely from the 20-year fertilizer agreement concluded in 1973 by Occidental Petroleum with the Soviet Ministry of Foreign Trade. This elaborate compensation agreement, which involved construction of ammonia production, storage and pipeline facilities in the U.S.S.R., envisaged exchanges of Soviet ammonia and urea for American superphosphoric acid (SPA) reaching \$1 billion per year. Actual exchanges have remained well below half that level.

Implementation of the agreement has experienced a variety of problems. First, the projected volumes were based on prices for the two major components prevailing when the agreement was concluded. By the time shipments began to reach substantial levels, the terms of trade had shifted strongly against the U.S.S.R. This threw the plans for a balanced exchange out of kilter and at various times has reportedly led to difficult annual negotiations. In 1979, when deliveries of Soviet ammonia reached \$56 million, they accounted for one third of total U.S. ammonia imports. Concerned about the prospect of the \$500 million level projected by the agreement, a group of American ammonia producers and importers petitioned the International Trade Commission (ITC) for import relief under the market disruption provision (Section 406) of the 1974 Trade Act. The ITC's original finding that imports of Soviet ammonia were causing, or threatening to cause, market disruption led to the imposition of quotas in January 1980. They were lifted after only two months when the ITC reversed itself. Since 1983, Soviet ammonia has accounted for 24-30 percent of total U.S. ammonia imports.

In 1982, the value of Soviet ammonia deliveries recovered to \$100 million, but, after peaking at \$156 million in 1984, has declined. For several years, a substantial portion has been imported with Occidental's approval by other buyers.

As part of the Afghanistan sanctions, the Carter administration in 1980 embargoed phosphate shipments to the Soviet Union. The embargo remained in effect for 14 months. Since their resumption in 1981 SPA shipments have averaged over \$200 million annually.

TABLE 7.—U.S. FERTILIZER TRADE WITH THE U.S.S.R.

(In millions of dollars)

	U.S. imports		U.S. exports SPA ¹
	Ammonia	Urea	
1980	95		17
1981	78		166
1982	101	12	268
1983	97	44	218
1984	156	52	186
1985	131	61	152
1986	91	66	261

¹ Super phosphoric acid.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Soviet urea deliveries under the Occidental agreement began in 1982 and in 1985 reached \$60 million. By mid-1986 they accounted for 23 percent of U.S. imports and for 11 percent of American urea consumption.¹⁴ Following this rapid growth, a group of U.S. urea producers filed a dumping complaint against imports from the Soviet Union, Romania and East Germany. A preliminary determination of injury was made by the ITC in September 1986, and in December the Department of Commerce issued a dumping order with an 84 percent margin for Soviet urea.

Prospects for U.S.-Soviet trade in this important commodity group are not clear. Demand for ammonia has declined since 1984. Urea imports stopped in September 1986 and may not resume as long as the large dumping margin is in force. The Soviet Union could replace some U.S. superphosphoric acid, which once faced no competition, by increasing its imports from Belgium and elsewhere.

III. INDUSTRIAL EXPORTS: COOPERATION AND TRENDS

U.S. industrial exports, other than chemicals, have lagged since the beginning of the 1980's. Machinery and equipment sales were adversely affected by the U.S.-Soviet climate as well as the stagnation in Soviet nonfood imports for hard currency.

Repercussions of U.S.-Soviet Tensions

First there were the immediate losses of equipment sales caused by the revocation or suspension of some export licenses, extended interruptions of the licensing process, and cancellation of several major U.S.-Soviet projects under the Afghanistan and Poland-related sanctions. The impact on potential sales of such measures as proscription of certain Soviet destinations (e.g., the Kama truck complex), the 1982 pipeline equipment embargo and the continuing restrictions on nonstrategic oil and gas equipment and technology from 1982-1986 has been more protracted. American exporters have complained that the greater duration and uncertainty of the export licensing process due to increased case-by-case determinations and time-consuming Defense Department reviews put them at a disadvantage vis-a-vis West European and Japanese competitors.

A prime example is the experience of the Caterpillar Tractor Co., which had established itself as a major Soviet supplier of heavy construction equipment in the 1970's. Their track-type tractors and pipelayers required no validated export license until 1978, when foreign policy controls over energy equipment were imposed in response to Soviet human rights violations. Despite increasing delays, in securing permission for spare parts shipments, the firm in 1981 obtained a Soviet order for 200 pipelayers, worth \$90 million. Issuance of the export license following Presidential approval took so long that it was caught under the Poland sanctions.¹⁵ As a result, Caterpillar was shut out of the Soviet market for 4 years, while its Japanese competitor Komatsu took over its 85 percent market share. In 1983 export licensing requirements for pipelayers were

¹⁴ *World Perspectives* (Newsletter), Vol. 7, No. 2, p. 23, Washington, September 1, 1986.

¹⁵ Brougher, J., *op. cit.*, p. 449, 452.

dropped. Two years later Caterpillar received a contract for 240 machines valued at \$80 million.¹⁶

Lack of official backing for nonstrategic trade, not to mention attacks on any kind of commercial dealings with the U.S.S.R. by some members of the administration, reportedly discouraged American business from seeking even sales that did not require validated export licenses. The U.S. Commercial Office in Moscow was constrained from taking part in trade promotion activities from 1980-85, and few American firms without prior Soviet experience ventured into the Soviet market during this period. Soviet interest in industrial cooperation also evaporated, despite high-level assurances of continued Soviet willingness to do business with U.S. companies. Proposals by American firms were ignored or turned away on the grounds that the United States was not a reliable supplier.

Shift in Soviet Priorities

The 11th 5-Year Plan (FYP) for 1981-85 stressed modernization and expansion of existing facilities rather than initiation of new projects. Since a large part of Soviet machinery purchases from the West are project-related, this presaged a smaller overall pie of hard currency equipment orders. The plan did not assign the same importance to foreign trade as its predecessor, and, moreover, called for an expansion in the share of communist countries in total Soviet trade. By 1985, the share of "developed capitalist countries" in Soviet trade had declined to 27 percent compared to 32 percent in 1981.

The impact of these factors was reflected in a lower volume of equipment orders from the West, which during 1982-86¹⁷ declined by almost 30 percent from the preceding 5-year period. Orders from the United States barely topped \$500 million, less than a third of those in 1977-81. Soviet contracts for the oil and gas sector and for metalworking equipment each accounted for about 25 percent of total Soviet orders since 1982, and in both sectors American suppliers were inhibited by stricter U.S. controls than their competitors. Soviet orders from the United States, after showing a strong upswing in 1985 in the wake of the 8th session of the Joint Commercial Commission, declined again in 1986. However, the American share of hard currency machinery and equipment contracts, which had averaged only 2 percent in 1981-83, remained in the 5-7 percent range for 1984-86.

Current Conditions

The 9th session of the Joint Commercial Commission in December 1986 expressed dissatisfaction with the level of trade in machinery and equipment. Both sides agreed to intensify the search for specific projects with realistic prospects for realization. Following the low percentage of projects that came to fruition among those identified at the 8th JCC session in 1985, the Commission plans to narrow its focus. Among the areas it intends to concentrate on are food processing, construction equipment, iron ore

¹⁶ Remarks by Richard Kahler, Caterpillar Tractor Company, to the American Committee on East-West Accord, Washington, March 20, 1986.

¹⁷ January 1982-September 1986.

smelting, coal slurry pipelines, irrigation equipment and chemicals. U.S. prospects in the high-priority Soviet agribusiness sector should also get a boost from the resumption in 1985 of exchanges under the U.S.-Soviet Agricultural Cooperation agreement.

The official termination in January 1987 of the requirement for export licenses for nonstrategic oil and gas equipment and services gives U.S. exporters in this field the green light to try and make a comeback in the Soviet market, where they held a substantial share prior to 1980. Soviet plans have reaffirmed the commitment to energy development, ensuring continued hard-currency allocations for this sector. The Soviet Union represents the largest market for petroleum equipment and services outside the United States.

The Soviet machinebuilding sector is receiving greatly increased investment funds to carry out far-reaching modernization plans for Soviet manufacturing industries. Except for possible export control problems, this sector might once again offer export opportunities for American firms which in the 1970's were successful in selling a wide range of machinery, including machine tools, to the Soviet Union.

New Soviet Emphasis on Foreign Trade

In order to realize the growth targets of the current 12th 5-Year Plan, the program adopted by the 27th Party Congress in February 1986 stresses scientific and technological progress, productivity growth through modernization of industry, a major overhaul of the Soviet economic machinery and upgrading of its management. Acknowledging that "the Soviet share in world trade does not correspond to . . . the requirements of its economic growth," the CPSU and the Soviet Council of Ministers in August 1986 passed a resolution "On Measures to Improve the Management of Foreign Economic Relations".¹⁸

Foreign Trade Reforms—Decentralization

Proceeding from the premise that more active Soviet participation in the "international division of labor" represents a factor of growing importance for Soviet economic development, the resolution launches major changes in the Soviet approach to foreign trade. The reforms aim at securing an increased flow of technology and marketing expertise to help upgrade Soviet manufacturing industry in order to: a) boost Soviet hard-currency exporting capability, and b) reduce the need for some Western imports. (Intensified cooperation with other socialist countries is the subject of a separate resolution.)

The reforms provide authority for 100 industrial ministries, production associations and enterprises to participate directly in foreign trade transactions beginning in 1987. The Ministry of Foreign Trade thus loses its longstanding monopoly for conducting Soviet foreign commerce, and must transfer to other ministries a number of the foreign trade organizations (FTO's) heretofore subordinate to it. The Ministry remains the principal trader in fuels, most other

¹⁸ ECOTASS No. 4, January 19, 1987, p. 2.

important raw materials, foodstuffs as well as in a number of goods "of national importance." The industrial ministries, organizations and enterprises that have been granted foreign trade rights currently account for 26 percent of Soviet foreign trade, and 14 percent of Soviet exports, including 65 percent of Soviet machinery exports.¹⁹ They are heavily concentrated in machinery and equipment production (49 out of 71 enterprises and production associations, 9 out of 14 ministries designated). The chemical, petrochemical and oil refining sectors are also strongly represented.

In order to give these entities more effective incentives for raising the quality of their output to international standards, they will be allowed to retain a substantial part of the hard currency their exports generate and to use them for purchases abroad.

For American, as for other Western exporters of capital goods, this decentralization should increasingly open up direct access to Soviet end-users in many sectors. In the longer run, this should improve their ability to generate demand for American equipment. In the past, firms often reported that end-users' preferences were overruled by FTO's. However, the reforms also mean that American firms will have to broaden their marketing activities, since they will no longer be dealing with just one importer, the FTO. Moreover, in the immediate future, the devolution process could lead to temporary disarray or paralysis, until the new system begins to function.

Joint Ventures

The most "revolutionary" aspect of the foreign trade reform is the authorization, for the first time since the 1920's, of joint manufacturing ventures with foreigners on Soviet territory. The goal of this move is to bring about "the transition from predominantly commercial ties to deepening specialization and co-production, especially in machinebuilding."²⁰

The priorities for East-West joint ventures (JV's) are:

- to produce goods not currently manufactured in the U.S.S.R. that can take the place of hard-currency imports, and
- to obtain Western expertise for expanding the production and marketing of hard-currency exports.

JV's, which require approval by the Council of Ministers, must be at least 51 percent Soviet owned and are governed by Soviet law. They will not be subject to plan goals, and while they are financially independent, they will have access to State and Foreign Trade Bank credits. JV's operate basically outside the domestic Soviet economy, with which they communicate through FTO's.

The areas which the Soviets have designated as of prime interest for such East-West cooperation include chemicals, especially pesticides, dying agents and fibers, various types of machinery production, the pulp and paper industry, and the consumer goods and foodstuffs sector. No East-West ventures may be established in mining, where cooperation is to be limited to CEMA members.

As of December 1986 seven American companies had signed preliminary letters of intent to form JV's; and 15 more proposals were

¹⁹ *Ibid.*, p. 3.

²⁰ ECOTASS, No. 42, October 20, 1986, p. 4.

under discussion, according to press reports citing First Deputy Minister of Foreign Trade V. L. Malkevich,²¹ the Soviet cochairman of the U.S.-U.S.S.R. Trade and Economic Council. These discussions include ventures for chemicals, plastics, soybean processing and reportedly involve Occidental Petroleum, Monsanto and Archer-Daniels-Midland, among others.

IV. IMPORTS AND CONSTRAINTS

The Soviets have long been concerned about the imbalance in their trade with the United States. The Soviet deficit, formerly largely a question of prestige, has increasingly presented practical problems, as Soviet hard currency earnings have shrunk in recent years, along with prices for energy, gold and other major Soviet exports.

The main reason for the low level of Soviet sales is that the United States itself is a major producer of the U.S.S.R.'s primary export products or has long standing relationships with other suppliers.

Lack of MFN

The Soviets have tended to blame their lack of success in expanding and diversifying exports to the United States largely on the lack of Most-Favored Nation (MFN) tariff treatment of their products in the United States. Various studies²² indicate, however, that extension of MFN tariff treatment would give only a modest boost to Soviet sales here in the short or medium term. In any case, Soviet manufactured goods sales have not scored any notable success in other developed Western countries where they do enjoy MFN treatment because of the unimpressive Soviet record in terms of quality of goods, services and marketing skills.

Special Obstacles

Absence of MFN treatment may have provided an excuse to Foreign Trade Organizations (FTO's) for not making a real export promotion effort in the United States. At the same time, it is true that the Soviets have encountered special problems in exporting not only manufactures, but also metals and chemicals, which can be attributed to both systemic and political factors.

Pricing

Because of the nature of the U.S.S.R.'s economic system and a desire to maximize certain exports, Soviet pricing of some of their products has laid them open to charges of market disruption and dumping. This problem is by no means limited to the United States. For that reason the Soviets have usually included provisions in their bilateral trade agreements that call for goods to be traded at "customary" or "prevailing international" prices. These

²¹ S. Rasky, "Soviet Deals Set With Four American Concerns", *New York Times*, December 11, 1986, p. D4.

²² Helen Raffel, et. al., "The MFN Impact on U.S. Imports from Eastern Europe" in Congress of the United States, Joint Economic Committee, *East European Economies Post-Helsinki*, pp. 1396-1427, Government Printing Office, August 25, 1977.

provisions are the basis for consultation arrangements to deal with trade complaints.

The 1972 U.S.-Soviet trade agreement contained a more explicit market disruption clause.²³ It set forth procedures under which the United States could request the U.S.S.R. to stop shipping goods, if the U.S. Government determined that they caused or threatened market disruption. Since the agreement was never ratified, the utility of such a provision in dealing with import problems outside existing U.S. regulations was never tested.

Nickel Ban

Unwrought Soviet nickel had been in the top ten U.S. imports from the U.S.S.R. since 1978, peaking in 1980 at \$35 million. In 1983 allegations surfaced that Soviet nickel shipments contained metal of Cuban origin. The U.S.S.R. imports a large part of Cuba's nickel output, but is itself a major nickel producer. U.S. regulations ban imports of Cuban origin materials, and Western exporters of products with nickel content (mostly steel) have provided assurances that their exports do not contain Cuban nickel.

When the Soviets did not respond to a request to provide such assurances U.S. imports of Soviet nickel were halted in November 1983. Subsequent efforts to resolve this question met with refusal by Soviet trade officials to consider modifying their normal certifications of origin until the 9th session of the JCC in December 1986. At that time, agreement was reached in principle that should end the embargo on nickel imports from the U.S.S.R. The specifics still remain to be worked out between the Treasury Department and Soviet government representatives.

Fur Embargo

A clear instance of discriminatory treatment has been the U.S. ban on the import of seven types of Soviet furskins, which dates back to 1951. As noted above, the United States agreed in May 1985 to seek legislation to end the embargo. Such legislation was introduced in both Houses and actively supported by the administration. Passed by the House of Representatives, it remained tied up in tariff legislation in the Senate which adjourned without acting on any trade bills. In December 1986 Secretary of Commerce Baldrige, in his opening remarks to 9th session of the Joint Commercial Commission, reaffirmed the U.S. executive branch commitment to resubmit the bill and seek its early passage in the 100th Congress.

Lifting this ban is of considerable importance as a demonstration of American willingness to remove barriers to two-way trade. Its quantitative impact is likely to be modest in terms of U.S. fur imports and of U.S.-Soviet trade. Of the seven types of furskins covered by the ban, only two—mink and fox—are still exported by the Soviet Union in significant quantities. The United States is a major producer of these furs, but American and Soviet skins differ widely in quality and generally compete in different market segments. Most American mink and fox pelts are exported, and the United

²³ U.S. Department of Commerce, *U.S.-Soviet Commercial Agreements 1972*, Washington, Government Printing Office, January 1973.

States imports about \$125 million worth of mink and fox annually. Imports of these furs from the Soviet Union would displace sales of other exporting countries rather than compete with U.S. production. Finally, Soviet furs have long been shipped to the American market by other countries in the form of apparel which is not covered by the embargo.

Slave Labor

A problem with potential to affect the import of Soviet products is the issue of slave labor. This issue first arose in September 1983, when Customs Commissioner von Raab submitted for Treasury review his "intended finding" that products from the Soviet forced-labor system are actually being, or are likely to be, imported into the United States. This finding was based on Section 307 of the 1930 Tariff Act (19 USC 1307), which provides in part that "all goods, wares, articles and merchandise mined, produced, or manufactured wholly or in part in any foreign country by convict labor or/and forced labor or/and indentured labor under penal sanctions shall not be entitled to entry at any of the ports of the United States, and the importation thereof is hereby prohibited . . ." ²⁴

An examination of the legislative history and past practice in enforcing the statute showed that past application has been "infrequent and inconsistent". ²⁵ In 1984, only one such determination was in effect.

In the past, canned crabmeat from the Soviet Union was barred from 1950 to 1961.

In May 1984, the Secretary of the Treasury found insufficient evidence to support a determination that specific goods were produced with forced labor. The ITC, at Congressional request, undertook a broadly based inquiry into international practices concerning compulsory labor. Neither its report ²⁶ nor evidence from the intelligence community established a direct link between Soviet forced labor practices and specific goods imported from the U.S.S.R. Then-Secretary of Treasury Regan decided in January 1985 not to prohibit the importation into the U.S. of goods produced in the Soviet Union.

A suit for failure to enforce Section 307, subsequently brought against Treasury by a number of members of Congress joining the Washington Legal Foundation and other plaintiffs, was dismissed by the Court of International Trade in July 1985.

In opposing the import ban, representatives of various government agencies emphasized that this was not a matter of condoning Soviet human rights violations, but of ensuring compliance with the established legal principle against selective enforcement, as well as giving due weight to sensitive trade and foreign policy con-

²⁴ Forced labor is defined in 19 USCS 1307 to mean "all work or service which is exacted from any person under the menace of any penalty for its nonperformance and for which the worker does not offer himself voluntarily."

²⁵ J. Robert McBrien, Deputy for Security Affairs and Crisis Management, Department of the Treasury, Statement before the Commission on Security and Cooperation in Europe, p. 2, Buffalo, August 15, 1985.

²⁶ International Trade Commission, *International Practices and Agreements Concerning Compulsory Labor and U.S. Imports of Goods Manufactured by Convict, Forced or Indentured Labor*, Washington, December 18, 1984.

siderations.²⁷ Moreover, Treasury representatives have made it clear that in the future "if sufficient, credible evidence were to be developed concerning the importation of specific types of slave labor products from the Soviet Union, the Treasury would . . . prohibit their entry."²⁸

V. FACTORS FACILITATING AND RESTRICTING FUTURE TRADE

A. RECENT U.S. AND SOVIET DEVELOPMENTS

Since 1985, a number of developments have occurred that could offer new opportunities for an expansion of U.S.-Soviet trade relations.

U.S. Steps

Given the importance the Soviets attach to formal structures for commercial relations, any significant improvement in U.S.-Soviet trade required the reopening of governmental communications. By reviving the Joint Commercial Commission and by preserving in the EITCA a key element of the bilateral framework, the U.S. Government provided an essential condition for a return to more normal trade ties. Another prerequisite was the public expression of U.S. support for nonstrategic trade. Participation in the search for joint projects and efforts to remove some barriers to two-way trade should help to generate trade opportunities. Another positive factor is the strengthening of contract sanctity. The Export Administration Amendments Act of 1985 (EAAA) contains a provision that would preserve intact preexisting contractual arrangements in the event that foreign policy controls on exports are declared. The Act contains even stronger safeguards for agricultural exports. Thus, the reliability of U.S. supply would be ensured under the EAAA, except in situations posing a direct threat to the strategic interest of the United States.

Export Controls

The pendulum on export controls appears to be swinging toward a more moderate approach, both with respect to foreign policy and national security controls.

Developments in the application of export control regulations since 1983 have lessened some restraints on exports of nonstrategic industrial goods. A move in this direction was the lifting as of January 21, 1987 of foreign policy controls on exports of nonstrategic oil and gas equipment and technology to the Soviet Union.²⁹ With this return to the pre-1978 status, the attempt to use energy equipment as a special policy lever has come full circle.

As far as national security export controls are concerned, the era of ever broadening coverage of dual use and civilian hi-tech goods may be passing. At a time when the U.S. trade deficit and American competitiveness are major concerns, chances are that foreign

²⁷ Mark Palmer, Deputy Assistant Secretary of State, Statement before International Trade Subcommittee of the Senate Finance Committee, Washington, July 9, 1985.

²⁸ McBrien, *op.cit.*, p. 5.

²⁹ U.S. Department of Commerce, Press Release G87-1, January 15, 1987.

availability and other economic factors, which often got short shrift in recent years, will receive careful consideration.

The recent findings of a high-level National Academy of Science panel point in this direction.³⁰ After a 2-year study, the panel concluded that efforts to keep high technology from Soviet bloc states have not significantly improved national security but have cost the United States 188,000 jobs and \$9 billion a year. The panel, whose members have strong defense and intelligence backgrounds, recommends ending the Defense Department's "de facto veto" over technology sales and easing U.S. export controls to match those of our NATO allies.

Soviet Developments

Renewed Soviet emphasis on the importance of foreign trade and efforts to foster economic cooperation with the West are foremost among the elements in the Soviet picture that make for a brighter outlook for trade expansion.

The advantages of giving exporters broader access to end-users, as provided by the trade reforms, are evident. In addition, this access could also make American companies' search for products to import more productive. For example, efforts to work out counter-trade arrangements have often been frustrated by Soviet bureaucratic rigidities when products to be exchanged fell under different jurisdictions. In cutting out the middleman—the FTO—in some cases, and providing direct incentives to successful producers of hard-currency exports, the reforms may clear the way for would-be importers to find Soviet enterprises willing to produce to their specifications.

The possibility of joint ventures opens up new perspectives for East-West trade. However, at this early stage it is impossible to predict the extent of their impact on U.S.-Soviet commercial relations. It would be unrealistic to expect any tangible effect on trade before 1990. Some American firms interested in cooperation with the Soviet Union have pointed out that joint ventures anywhere are viable only where there is a strong home market and they have expressed reservations about the heavy Soviet emphasis on production for export. Pioneering JV's in the Soviet Union presumably will be the preserve primarily of companies with strong experience in trading with the U.S.S.R. and those familiar with Soviet operating conditions. Although ground rules for JV's are being promulgated with unusual speed, many aspects remain to be clarified and Soviet trade officials have cautioned that it will take two to three years for JV's to get off the ground.

JV's, like compensation arrangements, are no panacea. At the same time, it is worth noting that long-term two-way trade arrangements have provided substantial underpinnings for U.S.-Soviet nonagricultural commerce and have accounted for at least one-third of this trade. A major problem which caused some proposed coproduction projects in the 1970's to founder was Soviet refusal to permit a U.S. role in management and quality control. JV arrangements would eliminate this obstacle by specifically author-

³⁰ Auerbach, Stuart, "Panel Hits U.S. Curbs on Exports", *Washington Post*, January 12, 1987, p. A1, A16.

izing, and indeed seeking, the benefits of such inputs on a continuing basis.

Restrictive Factors

At the same time, many restrictive factors remain in place, and new ones have emerged. There appear no early prospects for modifying the restrictions on MFN and U.S. Government credits imposed by the Jackson-Vanik provisions of the 1974 Trade Act. In high-level trade discussions, U.S. representatives have emphasized that both sides should seek to expand trade within existing conditions, while fundamental policy changes must await parallel improvements in other aspects of U.S.-Soviet relations.

General economic conditions dampening prospects for trade growth are the Soviet hard-currency crunch and the large U.S. trade deficit. If a protectionist atmosphere should add to Soviet difficulties in narrowing its trade gap with the U.S. through increased sales, the U.S.S.R. may resort to curtailing its imports.

In this context, the 1986 cut in grain procurement is especially troubling, given the pivotal role of agricultural sales for U.S.-Soviet trade. Soviet expansion of its formal supply arrangements with other countries and, most recently, Soviet willingness to breach the LTA do not augur well for a recovery in the U.S. market share and raise doubts whether the Soviet market will continue to be the reliable substantial outlet for American grain it has been for a decade. The murky fertilizer situation represents another element of uncertainty.

Financing could become a bottleneck. Not only are official U.S. credits and export insurance off limits, but private credits have been minimal in recent years. The—albeit unsuccessful—introduction in 1985 of a Financial Export Control Act for the first time raises the possibility of national security controls being applied to commercial credits for the Soviet Union. Given the Soviet hard currency situation, availability of credit could be crucial for American exports.

Lastly, diminished U.S. Government resources and capabilities for supporting American firms with information, trade promotion and other assistance may limit U.S. business ability to take full advantage of potential opportunities.

B. EAST-WEST AGENDA

Lasting improvement and expansion in U.S.-Soviet trade depends on substantial progress in other aspects of superpower relations, particularly human rights, arms control and regional disputes. In the sphere of human rights, with which trade has been most directly linked through Jackson-Vanik, recent Soviet actions have been encouraging. But Soviet conduct in tolerating dissent, freeing dissidents and liberalizing emigration has a long way to go before it meets the norms laid down by the Helsinki agreement or the intent of Jackson-Vanik.

Until there is much greater stability in superpower relations, any U.S.-Soviet confrontation, however brief, has the potential to disrupt trade ties for a long time, as the past decade and a half has shown. A material easing of U.S.-Soviet tensions is necessary to

lessen these uncertainties which restrain U.S. firms and, presumably, the Soviets from seeking to maximize opportunities that changes in U.S.S.R. economic and foreign trade strategy may offer.

BIBLIOGRAPHY

- Baldrige, Honorable Malcolm, Opening Remarks at the 9th Session of the Joint U.S.-U.S.S.R. Commercial Commission, Washington, December 4, 1986.
- , Remarks at the Closing of the 9th Session of the Joint U.S.-U.S.S.R. Commercial Commission, Washington, December 5, 1986.
- , Remarks to the 10th meeting of the U.S.-U.S.S.R. Trade and Economic Council, New York, December 9, 1986.
- Chapman, Margaret and Carl Marcy, editors, *Common Sense in U.S.-Trade*, Washington, American Committee on East-West Accord, 1983.
- Hardt, John P., Testimony to House Committee on Energy and Commerce, Subcommittee on Commerce, Transportation and Tourism, June 25, 1986.
- , and Jean F. Boone, "Agriculture: U.S.-U.S.S.R. Sales and Prospects for Expanded Trade, CRS Issues Brief, August 19, 1986.
- , "U.S.-U.S.S.R. Commercial Relations: Issues in East-West Trade, CRS Issue Brief, August 22, 1986.
- U.S. Department of Agriculture, Situation and Outlook Reports, Economic Research Service, RS-84-4, May 1984. RS-85-4, April 1985. RS-86-3, May 1986.
- , World Agriculture, Situation and Outlook Reports, WAS-44, June 1986. WAS-45, Sept. 1986. WAS-46, Dec. 1986.
- U.S. Department of Commerce, Agreed Report of Ninth Session of the Joint U.S.-U.S.S.R. Commercial Commission, December, 1986.
- , Agreed Report of the Eight Session of the Joint U.S.-U.S.S.R. Commercial Commission, *Business America*, Vol. 8, No.12, pp.11-13, June 10, 1986.
- , Statement of Franklin J. Vargo, Deputy Assistant Secretary for Europe, before the Subcommittee on Trade, Senate Finance Committee, May 8, 1986.
- , Statement of Franklin J. Vargo, Deputy Assistant Secretary for Europe, before the Subcommittee on Commerce, Transportation and Tourism, House Committee on Energy and Commerce, June 25, 1986.
- , *United States Trade—Performance in 1985 and Outlook*, International Trade Administration, June 1986.
- U.S. Department of the Treasury, "Treasury Postpones Findings on Forced Labor Goods", Press Release R2686, May 17, 1984.
- World Perspectives, monthly newsletter, Washington, 1985-86.

THE USSR'S HARD CURRENCY TRADE AND PAYMENTS POSITION

By Joan F. McIntyre*

CONTENTS

	Page
I. Summary.....	474
II. Trade trends in the 1980's.....	475
A. Exports.....	477
B. Imports.....	479
III. Other transactions.....	480
IV. The debt.....	482
V. Outlook.....	485

TABLES

1. USSR: Hard Currency Trade by Major Partners.....	477
2. USSR: Hard Currency Trade by Major Commodities.....	478
3. USSR: Orders of Machinery and Equipment by Type.....	479
4. USSR: Estimated Hard Currency Balance of Payments.....	480
5. USSR: Estimated Hard Currency Debt to the West.....	482

FIGURES

1. USSR: Hard Currency Imports and Exports, 1970-1986.....	476
2. USSR: Debt Service Ratio, 1972-1986.....	484

APPENDIXES

A. Soviet Hard Currency Trade Partners.....	486
B. Methodology for Estimating Soviet Debt.....	487

I. SUMMARY

Following a period of rapid growth in the 1970's, Soviet hard currency trade gave way to relative stagnation during the first half of the 1980's.¹ With the price of oil beginning to weaken by 1982, traditional Soviet financial conservatism—reinforced by the Polish debt crisis, dissatisfaction with the benefits of imported Western technology and Western trade sanctions—acted to brake further Soviet trade expansion with the West. Hard currency exports

*Office of Soviet Analysis, Central Intelligence Agency. The author wishes to express her appreciation to John Cushman, Millicent Taylor and Kevin Tritle for their assistance. Information as of 20 April 1987 was used in the completion of this paper.

¹ By hard currency trade we refer to trade with those countries that Moscow settles its accounts in freely convertible currencies. Included in this trade are barter transactions and credit arrangements conducted with these countries (see appendix A for a list of hard currency trade partners). Excluded are hard currency transactions with countries with which Moscow settles accounts with through non-convertible clearing accounts. For details of the USSR's trade and payments position during the 1970's see Zoeter, Joan P., "USSR: Hard Currency Trade and Payments," *Soviet Economy in the 1980's: Problems and Prospects, Part 2*, JEC, Washington, D.C., Dec. 31, 1982.

peaked at \$32.4 billion in 1983 while imports held steady in the \$27-28 billion range for several years. Net borrowing and gold sales also remained low during the early 1980's.

Oil production problems in 1985 and a substantial drop in world oil prices in 1986 pushed export earnings down forcing Moscow to trim imports, even while increasing borrowing and gold sales. The depreciation of the dollar has compounded Moscow's difficulties by decreasing the purchasing power of Soviet exports which are priced largely in dollars. With few prospects for significant improvements in the world price of oil for the next several years, Moscow will have to deal with reduced earnings through the remainder of the decade. Sizable borrowings in both 1985 and 1986 make it highly unlikely that the USSR will continue increasing its debt to offset reduced earnings, thus forcing imports to levels lower than those recorded earlier in the decade. Indeed, the Soviets have recently canceled, postponed, or scaled back several multibillion dollar projects that were under negotiation with Western firms in late 1985.

How Moscow will apportion these cuts among the traditional hard currency claimants is unclear at this moment. The import pattern that emerges should give a clearer indication of the relative importance of various economic sectors to Gorbachev's program. Given the importance of imports of intermediate goods such as steel and chemicals in meeting current production targets—at least at the margin—these imports will probably be protected from any major reduction. Imports of machinery and agricultural commodities are likely to bear the brunt of import reductions. If favorable weather and improved livestock feed efficiency reduce the need for large imports of farm products, cutbacks in machinery and equipment imports—especially those important to Gorbachev's modernization drive—can be minimized.

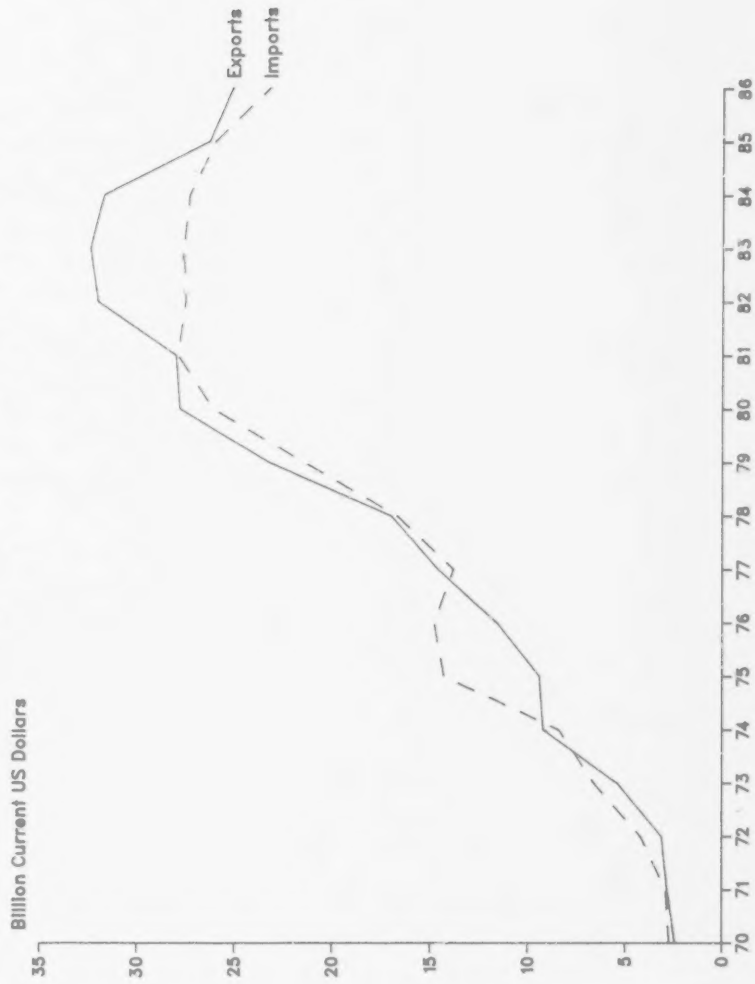
II. TRADE TRENDS IN THE 1980's

Following a temporary hard currency bind in 1981, Moscow acted quickly to improve its overall trade position.² With exports increasing more than imports, Moscow's trade surplus soared to \$4.5 billion in 1982 and remained at over \$4 billion in 1984-85 (see Figure 1). In 1985, however, reduced Soviet oil exports caused the surplus to fall to \$534 million, despite a 6 percent decline in imports. The collapse in world oil prices in 1986 resulted in further cuts in both imports and exports, although imports fell further, allowing Moscow to push its trade surplus above \$2 billion.

² Official Soviet foreign trade statistics published in *Vneshnyaya Torgovlya, USSR*, annual editions are the sources of the trade statistics used in this paper. Trade figures for 1986 are from "Foreign Trade 3," 1987.

Figure 1

USSR: Hard Currency Imports and Exports, 1970-86



Throughout most of the period, the USSR ran sizable trade surpluses with many of its partners in Western Europe and the Third World (see Table 1). The countries with which the Soviets ran deficits were, for the most part, those from which they imported sizable amounts of agricultural products (the United States, Australia, Canada, Argentina, and Brazil). The USSR has used the bulk of its excess earnings from energy exports to Western Europe to pay for imports from these countries.

TABLE 1.—USSR: HARD CURRENCY TRADE BY MAJOR PARTNERS, 1985-86

[In millions of current U.S. dollars]

	1985			1986		
	Exports	Imports	Balance	Exports	Imports	Balance
Total.....	26,387	25,853	534	25,104	23,088	2,016
Developed countries.....	19,731	20,077	-346	16,560	19,275	-2,715
Of which:						
Australia.....	16	639	-623	12	723	-711
Austria.....	966	1,030	-64	767	1,210	-443
Canada.....	21	1,139	-1,118	14	886	-872
France.....	2,609	1,924	685	2,188	1,604	584
Italy.....	2,961	1,590	1,371	2,244	2,093	151
Japan.....	1,114	2,744	-1,630	1,392	3,132	-1,740
Netherlands.....	1,184	376	808	818	348	470
Sweden.....	591	368	223	423	348	75
Switzerland.....	461	680	-219	408	647	-239
United Kingdom.....	1,461	821	640	1,809	731	1,078
United States.....	391	2,852	-2,461	444	1,627	-1,183
West Germany.....	4,790	3,713	1,077	3,863	4,058	-195
Less developed countries.....	6,656	5,776	880	8,544	3,813	4,731
Of which:						
Argentina.....	75	1,476	-1,401	76	273	-197
Brazil.....	84	456	-372	43	336	-293
Iraq.....	321	668	-347	416	491	-75
Libya.....	100	1,053	-953	50	988	-938

A. EXPORTS

Despite the weakening oil market, energy products have continued to dominate Soviet hard currency exports and, in fact, increased their share in total exports through 1985 (see Table 2). Although the volume of oil exports fell about 10 percent in 1985, energy products accounted for 58 percent of total hard currency exports compared to 53 percent in 1980. Moreover, crude oil and oil products continue to account for the bulk of these exports as sizable increases planned for earnings from gas sales through the recently Siberia-to-Western Europe natural gas pipeline failed to materialize. Gas exports in 1985 were below the 1981 level of \$4 billion as price reductions offset a 12 percent growth in volume between 1981 and 1985, and Soviet customers sought to scale back purchase commitments. In 1986, however, the drop in world oil prices—which also affected gas prices, albeit on a delayed basis—pushed the share of energy products in total exports below the 50 percent mark.

TABLE 2.—USSR: HARD CURRENCY TRADE BY MAJOR COMMODITIES

[In millions of current U.S. dollars]

	1970	1975	1980	1981	1982	1983	1984	1985
Exports								
Total	2,405	9,453	27,874	28,254	31,975	32,429	32,173	26,387
Oil and oil products	387	3,170	12,123	11,887	14,824	15,569	15,111	11,471
Natural gas	1	220	2,710	3,968	3,673	3,194	3,754	3,813
Machinery and equipment	123	450	1,227	1,206	1,347	1,407	1,229	1,098
Wood	365	714	1,510	1,018	853	857	824	711
Chemicals	61	242	758	807	703	748	1,017	1,012
Agricultural products	167	522	458	555	474	333	181	179
Military	240	1,903	5,131	5,980	7,220	7,162	6,889	4,935
Other	1,061	2,232	3,957	2,833	2,881	3,159	3,168	3,168
Imports								
Total	2,711	14,257	26,060	27,889	27,507	27,717	27,446	25,853
Agricultural products	613	3,914	8,804	11,829	9,919	9,127	9,468	8,106
Grain	101	2,323	4,503	6,327	5,506	4,876	6,315	5,253
Other	512	1,591	4,301	5,502	4,413	4,251	3,153	2,853
Non-agricultural products	2,098	10,343	17,256	16,060	17,588	18,590	17,978	17,747
Machinery and equipment	927	4,593	6,039	4,523	6,114	7,009	5,822	4,818
Ferrous metals	285	2,627	3,622	3,605	4,284	3,713	3,460	3,644
Chemicals	248	800	1,953	1,771	1,724	1,763	1,814	2,250
Fuels	8	497	831	503	1,579	2,100	2,732	2,734
Other	630	1,826	4,811	5,658	3,887	4,005	4,150	4,301

Large arms sales to Mid-East OPEC customers in the late 1970's and early 1980's spurred rapid growth in Soviet arms exports through 1983.³ As the economic fortunes of these countries began to wane, Soviet arms exports—which have accounted for roughly 20 percent of total hard currency exports during the early 1980's—also fell. Between 1983 and 1985, these exports dropped by approximately 30 percent, helping to push down further total Soviet hard currency exports. Nominal dollar sales of arms to the Third World rose substantially in 1986, due partly to the depreciation of the dollar.⁴

Weak Western demand for Soviet non-energy, non-arms exports during the 1980's has hindered the growth of these exports; in 1985 these exports were 35 percent below the 1980 level. With the exception of chemicals, which showed substantial growth in 1984 and 1985, the USSR has been particularly unsuccessful in its efforts to expand exports of manufactured goods, especially machinery and equipment. In fact, the USSR has encountered increasing difficulties in marketing its equipment to traditional buyers in the less developed countries (LDCs). Some recovery in the growth of these exports was evident in 1986, possibly due to increased sales of non-fuel raw materials.

³ Arms sales are determined largely as a function of the unexplained trade residuals in Soviet statistics.

⁴ We assume that most military items are priced in rubles, which appreciated by 19 percent vis-a-vis the dollar in 1986.

B. IMPORTS

The USSR has cut back imports from a peak of \$27.9 billion in 1981 to less than \$24 billion in 1986. Reduced export earnings are largely to blame, but increased Soviet sensitivity to appearing dependent on the West, coupled with a continued disillusionment with the benefits of Western technology have also contributed. Following a trend observable since the mid-1970's, agricultural products account for the largest share of total imports, averaging about one-third of the total throughout the 1980's. These imports, however, remained substantially below the record 1981 level of \$12 billion; even with record volumes of grain imports in 1984, low agricultural prices and sharply reduced imports of non-grain commodities pushed purchases to almost 20 percent below the 1981 level. Continuing low prices and improved harvests in 1985 and 1986 allowed the Soviets to cut imports of farm products even further, to \$8.1 billion in 1985 and an estimated \$6 billion in 1986.

Although Moscow continues to rely on the West for certain types of machinery and equipment, especially in the energy sector, real imports of machinery and equipment declined substantially during 1981-85. Even without taking inflation into account, these imports remained at the 1976-80 level of about \$28 billion for the entire period. Machinery imports rose to about \$7 billion in 1983 due to deliveries for the Siberia-Western Europe pipeline, but they, nonetheless, remained below the peak 1976 level in real terms. With the completion of the pipeline and with few large orders of Western equipment on the books, these imports dropped sharply to under \$5 billion in 1985 (see Table 3). As a result of large orders placed in 1985—when Soviet planners were gearing up for the new five-year plan—and the sharp depreciation of the dollar, the value of these imports in 1986 showed little reduction from the previous years, despite Soviet efforts to trim purchases.⁵

TABLE 3.—USSR: EQUIPMENT ORDERS PLACED WITH HARD CURRENCY TRADING PARTNERS ¹

	[In millions of current U.S. dollars]											
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	
Total	5,866	3,783	2,818	2,674	2,641	6,721	3,774	2,236	1,270	3,974	2,110	
Oil and natural gas projects.....	1,651	322	832	190	397	4,288	1,326	835	67	644	297	
Chemical and petrochemical equipment.....	1,818	1,628	702	607	412	420	506	379	66	328	91	
Metalworking and metallurgical equipment.....	1,028	641	363	784	806	592	802	387	118	1,625	40	
All other projects	1,512	1,192	921	1,093	1,026	1,461	1,140	635	1,019	1,377	1,682	

¹ When comparing Soviet orders for Western equipment with actual deliveries the reader should bear in mind that the information represents only a portion of total machinery and equipment imports and that lags, running from a few months to several years, exist between the date a piece of equipment is ordered and the time it is delivered—and that this relationship may have changed over time. In addition, because of insufficient information, problems sometimes exist in classifying contract orders, so that a contract included under oil and gas projects, for example, may show up in Soviet trade data under imports of ferrous metals. Therefore, order data should be considered as indicating general trends in trade, rather than as a predictor of future import levels.

The USSR continued to be a steady importer of a number of important intermediate goods, especially steel and chemicals. Moscow has relied on imports of large diameter pipe to cover a substantial share of its requirements for pipeline construction, and specialty

⁵ See "Soviet Cutting Back on Some Major Projects," *Business Eastern Europe*, March 17, 1986, p. 84.

steel has been important, on the margin, to aid production in the machine-building sector. While the nominal value of these imports have declined somewhat since 1982, price declines for Western steel products have kept real imports relatively steady throughout the period. Imports of chemicals reached \$2.3 billion in 1985 as Moscow looked to imports to overcome domestic shortages and improve agricultural production.

Moscow also increased its hard currency imports of fuels from mid-East OPEC countries, primarily Iraq and Libya, as part of "arms for oil" barter arrangements. These imports, which increased from \$500 million in 1981 to \$2.7 billion in 1985, are mostly reexported. The fall in world oil prices reduced the dollar value of Moscow's oil imports from these countries in 1986, even though the volumes increased.

III. OTHER TRANSACTIONS

Information on Soviet net earnings from invisibles and other transfers is scarce (see Table 4). Transportation services account for the largest share of Soviet net earnings from invisibles and include earnings by the Soviet merchant fleet and by the Trans-Siberian Landbridge. With freight markets weak for most of the 1980's, earnings from these sources have probably stagnated and may have even declined. Other transport earnings include overland transit services for freight moving between Europe and Iran and air passenger traffic, although earnings from these sources are believed small. At the same time, Soviet expenditures for the carriage of grain and other imports have remained high. In particular, higher transportation costs due to sizable grain imports during 1981-85 probably offset savings from lower shipping rates.

TABLE 4.—USSR: ESTIMATED HARD CURRENCY BALANCE OF PAYMENTS

	[In million of current U.S. dollars]							
	1975	1980	1981	1982	1983	1984	1985	1986 ¹
Current account balance	-4,481	1,619	-74	4,590	4,745	4,637	12	986
Merchandise trade balance	-4,804	1,724	365	4,468	4,712	4,727	534	2,016
Exports, f.o.b.	9,453	27,784	28,254	31,975	32,429	32,173	26,387	25,104
Imports, f.o.b.	14,257	26,060	27,889	27,507	27,717	27,446	25,853	23,086
Net interest	-437	-995	-1,439	-978	-1,067	-1,190	-1,622	-2,130
Other invisibles and transfers	760	890	1,000	1,130	1,100	1,100	1,100	1,100
Capital account balance	5,220	-67	2,964	-3,393	-1,983	-803	5,787	6,199
Net foreign borrowings ²	5,600	-730	954	-391	1,516	274	7,434	8,006
Official credits	1,500	-252	-1,901	1,101	412	-249	718	800
Gross Drawings	2,022	2,341	1,073	2,964	3,185	2,226	2,245	3,200
Repayments	522	2,593	2,972	1,863	2,773	2,475	1,527	2,400
Commercial credits	4,100	-478	2,855	-1,492	1,104	-523	6,716	7,206
Gross Drawings	4,621	737	4,032	208	2,032	1,495	8,766	9,307
Repayments	521	1,215	1,177	1,700	928	972	2,050	2,101
Net change in assets held in Western banks ³	390	-33	-180	1,982	1,049	-623	1,747	1,707
Net credits to the LDCs	715	950	870	2,120	3,200	2,700	1,700	4,100
Gold sales	725	1,580	2,700	1,100	750	1,000	1,800	4,000
Net errors and omissions ⁴	-739	-1,552	-2,890	-1,197	-2,762	-3,834	-5,799	-7,185

¹ Preliminary

² Including additions to short-term debt

³ A minus sign signifies a decline in the value of assets.

⁴ Includes hard currency assistance to and trade with Communist countries, credits to developed Western countries to finance sales of oil and other commodities, other nonspecified hard currency expenditures, as well as errors and omissions in other line items of the accounts.

In addition to net earnings from transport services, tourism has also generated some hard currency receipts, perhaps as much as \$500 million annually during the 1980's. Data on Soviet transfer payments are generally unavailable, but some items can be gathered from Western sources. For example, Soviet contributions to the United Nations averaged under \$200 million annually for 1981-86. Overall, net services and transfers have earned Moscow an estimated \$1.1 billion per year during the 11th five year plan period. Offsetting these earnings have been sizable net outflows of interest payments. Between 1981 and 1984, these payments dropped by about \$250 million as Moscow moved to decrease its net debt. As the USSR has responded to lower export earnings by stepping up borrowing since 1985, net yearly interest payments have climbed over the \$2 billion mark.

Gold sales are reported in the capital account rather than the current account because the Soviets tend to use gold primarily as a financing mechanism rather than as a trade commodity like oil. The Soviets generally sell more gold when they need a rapid infusion of cash, and less—even when prices are high—when they are in a good cash flow position. Thus, during the mid-1970's when they needed to finance large purchases of equipment and grain while holding down debt, gold sales were high. Gold sales slumped between 1982 and 1984—averaging under 100 tons per year—as record oil sales to the West combined with stagnant imports obviated the need for extra cash. The decline in oil earnings beginning in 1985 sparked increased gold sales, estimated at almost 200 tons in 1985 and more than 300 tons in 1986.⁶

To support trade with the LDCs, the USSR offers attractive credits on sales of both military and civilian equipment. In general, these credits carry terms of 10 to 12 years for repayment at interest rates of 2 to 6 percent. Net credits to the LDCs were estimated at under \$1 billion through 1981 as rapidly rising world oil prices allowed for a rapid expansion of cash sales of arms to OPEC countries. Since then, accelerating financial problems in the Third World have led to payment delays and a larger requirement for financing among Soviet customers and, as a result, net credits have averaged an estimated \$2.8 billion annually.⁷

When all of the line items are added up and net financing received is taken into account, estimates of sources of hard currency differ substantially from known or estimated expenditures. This calculated residual ("errors and omissions" in Table 4) in most years implies a net hard currency outflow for the USSR which has averaged \$3.9 billion in 1981-86. Apart from the likelihood that estimating errors are substantial, the residual reflects the exclusion of numerous items from the accounts (because of substantial information gaps). Important exclusions include:

⁶ Estimates for Soviet gold sales are derived from a variety of sources such as the *Annual Bullion Review*, published by Samuel Montagu & Co. Limited, and the *Annual Review of the World Gold Industry* published by Shearson Lehman Brothers. Also see "Soviets Unloading Much More Gold this year than in 1985, Analysts Say," *Wall Street Journal*, 1 Dec. 1986, and "Changes for Gold in London," *The Banker*, January 1987, pp. 20-21.

⁷ For a more detailed discussion of the USSR's trade and aid program toward LDCs see "Moscow's Economic Aid Programs in Less-Developed Countries: a Perspective on the 1980's" by Carol Fogarty and Kevin Tritle in this compendium.

Hard currency trade and assistance to other Communist countries.

Net credits—mainly short term—provided to the developed West to finance the sales of oil and other commodities.

Hard currency expenditures in support of Communist parties and intelligence operations in the West as well as the net cost of supporting routine diplomatic and trade activities.

In the case of hard currency trade and assistance, some information is available. For example, Poland is estimated to have received about \$1 billion in assistance in 1981. Moscow's hard currency trade deficit with Hungary, the only East European country which provides sufficient data to make such an estimate, reached \$500-\$600 million in 1981, but has since declined steadily. Cuba has also benefitted from hard currency transactions with the USSR, through the sale of sugar for hard currency during the 1970's and early 1980's and more recently from the resale of Soviet oil on the world market.^a

IV. THE DEBT

The USSR has continued, for the most part, its conservative policy in managing its net hard currency debt to the West during 1981-84 (see Appendix B for a description of the debt estimation methodology). The unexpected drop in hard currency earnings since 1984, however forced Moscow again into heavy borrowing to cover the shortfall (see Table 5). Gross debt increased by over \$7.7 billion per year in 1985-86, to about \$38 billion although the Soviet policy of maintaining a high level of assets in Western banks held net debt to just \$23 billion.

TABLE 5.—USSR: ESTIMATED HARD CURRENCY DEBT TO THE WEST

[In billions of current U.S. dollars]

	1975	1980	1981	1982	1983	1984	1985 ¹	1986 ¹
Gross debt.....	11.5	20.4	21.4	21.0	22.5	22.8	30.2	38.2
Commercial debt ^a	7.2	9.7	12.6	11.1	12.2	12.7	19.4	26.6
Government and government-backed debt ^a	4.3	10.7	8.8	9.9	10.3	10.1	10.8	11.6
Assets in Western banks.....	3.6	9.4	9.2	11.2	12.2	11.6	13.3	15.0
Net debt.....	7.9	11.0	12.2	9.8	10.3	11.2	16.9	23.2

¹ Preliminary estimates.

^a Estimates of government-backed and commercial debt have been adjusted for fluctuations in exchange rates. Commercial debt also includes estimates for promissory notes held outside banks.

About two-thirds of Soviet gross debt is owed to commercial banks and other private sources. The Soviets tapped such credits judiciously throughout the early to mid-1980's in contrast to the rapid growth in borrowing during the 1970's. Short term borrowing was used in 1981 and early 1982 to cover an unexpected shortfall in hard currency requirements, while the USSR remained out of the market for syndicated general purpose loans. Beginning in late

^a A comparison of Soviet and Cuban trade data indicate that Soviet oil sold in the West on Cuban account, including oil swapped with Venezuela, are counted as Soviet exports to the West in Soviet statistics, thus overstating Soviet hard currency oil earnings.

1984, the Soviets took advantage of their favorable credit ratings and generous terms being offered by bankers to creditworthy customers to negotiate several syndicated loans. The pace of syndicated borrowing accelerated in 1985 and remained high in 1986 as Moscow's trade position deteriorated. Such borrowings reached approximately \$3 billion in both 1985 and in 1986. In addition, since late 1985, Moscow has increased its use of promissory note financing to cover purchases of Western equipment.⁹

Although officially-backed credits accounted for about one-half of Soviet gross debt during most the 1980's, the sharp increase in commercial borrowing in 1985 dropped this share to about 30 percent. Government-backed debt has increased slightly during the period. In fact, the appreciating dollar through 1984 kept this debt below the 1980 level, even with increased drawings for the Siberia-to-Western Europe pipeline. Consistent with stagnant Soviet purchases of machinery and equipment, the volume of new credit commitments fell sharply from a peak of nearly \$5 billion in 1981.

In determining the USSR's net debt to the West, the only hard currency assets taken into account are deposits in Western banks which are relatively liquid. At the same time, Moscow is owed at least \$25 billion in hard currency from LDC borrowers, but the value of this debt is problematic since a considerable portion is owed by clients who will probably be unable to repay their debts in a timely fashion. The USSR also has large gold reserves, worth over \$30 billion at early 1987 prices of \$400 a troy ounce.

Sufficient information is not available to estimate the breakout of the USSR's hard currency debt by creditor. U.S. publications say that the USSR owed \$378 million net of assets to domestic and major foreign branches of U.S. banks as of the end of 1986, \$236 million to the Export-Import Bank and \$674 million on Lend Lease extended in 1945.¹⁰ A West German Bundesbank report indicates that as of end-1985, net liabilities to German banks and their foreign branches were \$2.8 billion.¹¹ The Bank of England reports Soviet net debt to British banks stood at \$4.13 billion at the end of 1985.¹²

Debt size reveals little about a country's ability to meet its financial obligations and to sustain needed imports. Using the ratio of repayments on medium and long term debt plus interest on total debt to hard currency revenues show that the USSR has kept its debt service ratio well below 20 percent through most of the early 1980's (see Figure 2). The sharp upturn in borrowing in 1985-86 has pushed this debt-service ratio to about 23 percent, which is still quite manageable.

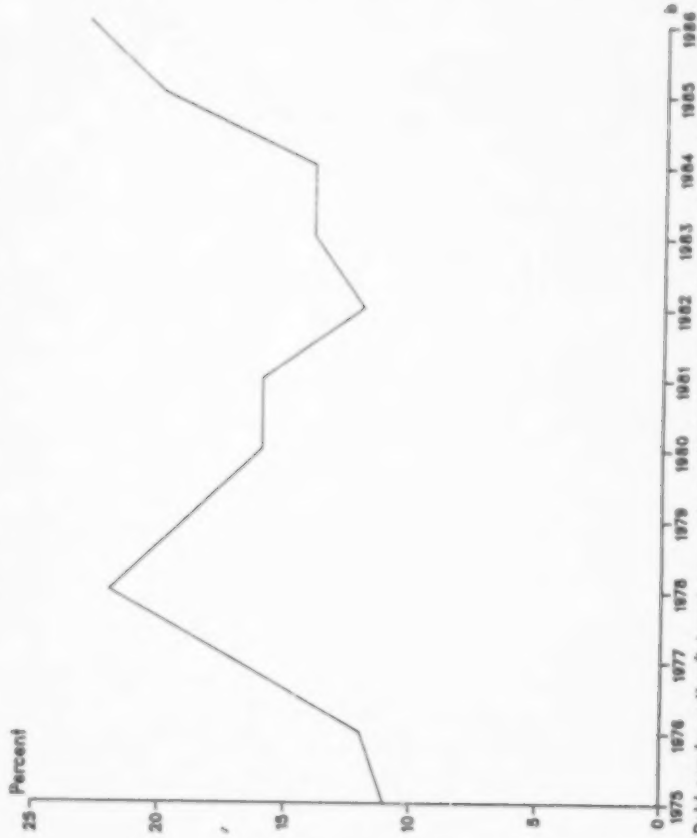
⁹ "Financing EE Sales Through Forfaiting," *Business Eastern Europe*, June 9, 1986, p. 177.

¹⁰ *Federal Reserve Bulletin*, February, 1987, and *Status of Active Foreign Credits*, Sept. 30, 1987.

¹¹ *Bundesbank Monthly Report*, Series 3, March 1987.

¹² *Bank of England Quarterly Bulletin*, December 1986.

Figure 2

USSR: Debt Service Ratio^a, 1975-86

^a Debt service ratio=(interest payments + principal repayments) divided by total hard currency earnings.

^b Preliminary.

V. OUTLOOK

While the reduced export level in 1985 was probably viewed by Soviet trade planners as a temporary setback resulting from severe winter weather and production problems in the oil sector, the sharp drop in world oil prices has dramatically altered Moscow's earnings position over the longer term. Moreover, Moscow must also contend with a sharp erosion of its buying power caused by the likelihood that the U.S. dollar could remain depressed vis-a-vis other Western currencies. The bulk of Soviet hard currency exports, such as energy and raw materials, will continue to be priced in dollars, while many imports, especially machinery and equipment, will be priced in non-dollar currencies.

While the Soviet leadership has revealed little about its plans for trade with the West for the 1986-1990 period, it is likely that Moscow faces the prospect of real imports remaining at levels comparable to those in the mid-1970's. Such a scenario allows for some increase in borrowing—but by far less than the annual increments comparable to the 1985-86 period—heavy gold sales, and an average price of Soviet crude oil and oil products during 1986-90 of around \$18 per barrel. It also assumes that Moscow will be unable to increase substantially non-energy exports, including arms, during this period.

How Moscow will apportion these cutbacks among the various sectors of the economy is as yet uncertain. Its decisions could be somewhat eased by a reduced need for agricultural imports. Improved grain harvests, combined with more efficient feed techniques at low world grain prices, could reduce expenditures on grain by \$2-\$3 billion from the \$5.7 billion average in 1981-86. Some cutbacks in outright purchases of machinery and equipment may also be likely. The Soviets are pushing to limit the impact of machinery cutbacks, however, by substituting joint ventures for direct purchases which could limit up-front outlays of hard currency. In addition, the Soviets, in early 1987, instituted a program in which firms importing capital equipment could have greater input into its selection, but would have to pay for the imports through hard currency export revenues. It is hoped that through this reform, much of the waste and inefficiency associated with purchases of Western equipment will be eliminated, while providing an incentive for firms to export.¹³

The consumer, too, could suffer from import cutbacks. Large grain imports in the 1980's have kept the livestock program on track, while other imports—including vegetable oil, fruit, sugar, coffee, meat—have added quality and variety to a nutritionally adequate, but traditionally monotonous diet. In 1986, for example, the high price of coffee compounded by hard currency shortages resulted in substantially reduced availability in retail stores.¹⁴ A series of poor harvests would present the Soviets with particularly difficult choices when balancing consumption goals with hard currency constraints. If Moscow were to cut livestock herds to reduce

¹³ See McIntyre, Joan F., "Soviet Efforts to Revamp the Foreign Trade Sector," in this compendium.

¹⁴ "Official says Coffee shortage Result of High Price," Paris AFP, 9 Dec. 1986.

the need for imported grain, the achievement of the 1990 per capita meat consumption target would be postponed.

Because of the relatively small role that trades plays in the economy as a whole, the overall impact of import reductions on economic performance will be limited. The consequences for several key sectors, however, could be significant. Although the share of machinery and equipment purchased for hard currency is about 10 percent of total machinery investment, purchases of Western equipment have been important in improving production in the defense, chemical, metallurgical, oil and gas, and automotive industries. Moreover, the lofty goals of Gorbachev's modernization program—when matched against a realistic assessment of the capabilities of domestic industries—imply that some highly specialized imports from the West for such sectors as energy, microelectronics, and telecommunications must be continued if not increased. In addition, marginal changes in the availability of all resources become more important in an era of increasingly tight resources.

APPENDIX A

USSR: HARD CURRENCY TRADE PARTNERS, 1970-85¹ (AS REPORTED BY PARTNER COUNTRIES TO THE IMF)

DEVELOPED WEST

European Community

Belgium	Greece (1978 on)	Netherlands
Denmark	Ireland	United Kingdom
West Germany	Italy	
France	Luxembourg	

Other European Countries

Austria (1971 on)	Norway	Switzerland
Iceland (1977 on)	Portugal	Turkey (1983 on)
Liechtenstein	Spain	
Malta	Sweden	

Other

Australia	Japan	United States
Canada	New Zealand	South Africa

LESS DEVELOPED COUNTRIES

Africa

Algeria (1980 on)	Ghana (1976 on)	Mozambique
Angola	Guinea (1980 on)	Niger
Benin	Guinea-Bissau	Nigeria
Burkina	Ivory Coast	Rwanda
Burundi	Kenya	Senegal
Cameroon	Liberia	Sierra Leone
Cape Verde	Libya	Sudan
Central African Republic	Madagascar	Tanzania
Congo	Malawi	Togo
Ethiopia	Mali (1978 on)	Tunisia (1974 on)
Equatorial Guinea	Mauritania	Uganda
Gabon	Mauritius	Zaire
Gambia	Morocco (1982 on)	Zambia

Latin America

Argentina	Ecuador	Panama
Bolivia	El Salvador	Paraguay
Brazil	Guatemala	Peru
Chile	Honduras	Puerto Rico
Colombia	Jamaica	Trinidad and Tobago
Costa Rica	Mexico	Uruguay
Dominican Republic	Nicaragua	Venezuela

Asia and Middle East

Burma	Kuwait	Guyana
Cyprus	Lebanon	Singapore
Hong Kong	Macao	Sri Lanka (1977 on)
Indonesia	Malaysia	Thailand
Iraq	Nepal	U.A.E.
Israel	Philippines	North Yemen
Jordan	Saudi Arabia	South Yemen

¹ Some of the Soviet trade with hard currency LDC partners, however, probably is on a barter basis. Conversely, part of the trade with bilateral LDC partners may be on a hard currency settlement basis.

APPENDIX B

METHODOLOGY FOR ESTIMATING SOVIET HARD CURRENCY DEBT

Because the USSR does not release information regarding its financial position vis-a-vis the West, estimates of Soviet indebtedness must rely on Western financial reporting. Such reporting, however, is incomplete in its coverage, necessitating numerous, and sometimes tenuous, assumptions in calculating the structure and size of Soviet debt to the West.

Commercial Debt

We use as the basis of our estimates of Soviet commercial debt reporting by the Bank for International Settlements (BIS) on the asset and liability positions of Western commercial banks vis-a-vis the USSR. The BIS series is adjusted to account for (1) reported bank lending supported by official credit guarantees; (2) Japanese and Swiss bank positions reported to the BIS but not broken out with respect to the USSR until 1978 and 1983 respectively; (3) Austrian bank positions not reported to the BIS until 1977 and the positions of banks in Finland, Norway, Spain, and offshore banking centers that did not report to the BIS until 1983; (4) net Soviet borrowing from outside the BIS reporting area; (5) Soviet promissory notes held in the West but not included in BIS reporting and not carrying government guarantees; (6) net borrowing by CEMA's international banks, which Western banks include in their positions vis-a-vis the USSR.

The expansion of BIS coverage since the mid-1970s has reduced the amount of uncertainty in our estimates of Soviet commercial debt. In addition, reporting by the IMF of the bank positions of member countries vis-a-vis Eastern Europe, begun for end-year 1981, provides a basis for estimating Soviet liabilities and assets outside the BIS area. Using published International Bank for Economic Cooperation (IBEC) and International Investments Bank (IIB) balance sheets, we attempt to estimate that portion of Western bank reported claims on the USSR that actually represents lending to the two CEMA international banks.² We subtract these amounts from reported Western bank claims against the USSR to derive the position of the USSR alone.

Our estimates for Soviet promissory note financing and officially guaranteed lending included in bank reporting are much more tenuous. Information on Soviet promissory note financing is fragmentary, at best, and our estimates are based on the level of Soviet machinery imports, availability of officially-backed financing, and anecdotal information on Soviet activity in the promissory note markets. Since we lack authoritative information on this borrowing, our estimates are subject to a wide range of error. For example, in 1985 we estimated the amount of Soviet promissory notes held by non-bank institutions in the West at \$900 million. We believe that the actual total probably ranged from \$700 million to \$1.1 billion.

From available data on officially backed export credits, we have attempted to estimate that portion of bank lending that is also counted in our estimates of officially supported debt. While OECD/BIS estimates of Soviet debt suggest that 28-34 percent of BIS reported bank claims on the USSR is backed by official guarantees, we believe the share is much smaller.³ Although most government-backed credits are

² The latest published balance sheets for IBEC and IIB appear in "Deyatel'nost' MIB v 1985 godu," June 1986, p. 21 and "Deyatel'nost' MBES v 1985 godu," *Ekonomicheskaya Gazeta*, No. 22, May 1986, p. 20.

³ Joint OECD/BIS estimates were first published in Organization for Economic Cooperation and Bank for International Settlements, "Statistics on External Indebtedness: Bank and Trade-Related External Claims on Individual Borrowing Countries and Territories at End-December 1982 and End-June 1983," Paris and Basle, April 1984.

arranged through commercial banks, most governments have facilities available to repurchase such credits. The amounts involved and types of eligible credits vary among lending nations, sometimes affecting the reporting of the credits. For example, most official British credits are apparently held by commercial banks and reported both as bank credits and as government backed credits. Japanese banks probably provide 30-40 percent of funding for officially guaranteed credits causing some double counting. While banks in other countries probably hold some government backed credits, we believe the amounts are relatively small.⁴

In addition to making these adjustments to our debt estimates, we calculate commercial drawings and repayments. BIS statistics on the maturity structure of commercial debt, published since 1976, are used to generate a repayments stream for medium and long term credits. Before calculating credit drawings, the impact of exchange rate fluctuations on Soviet commercial debt must be evaluated. Starting in the first quarter of 1984, the BIS began reporting changes in assets and liabilities net of exchange rate fluctuations, which suggest that in 1986 about 40 percent of Soviet commercial liabilities and 30 percent of assets were in non-dollar currencies. However, our calculations based on the BIS data reveal that the currency composition of liabilities and assets is volatile. Credit drawings, including net changes in short-term debt, are calculated as the change in commercial debt after repayments and exchange rate fluctuations are taken into account.

Western Government-backed Debt

The estimate of that portion of Soviet debt backed by official Western credit guarantees is based on an analysis of unpublished data. From various sources, we have derived new commitments of guaranteed credits, drawings on these credits, repayments, outstanding debt, and total exposure. Since we must make a number of simplifying assumptions in computing these totals, we ascribe a 10 percent range of error to our estimates. Debt estimates for yearend 1985 and 1986 are largely extrapolations of past trends.

Like Soviet commercial debt, the size of officially backed debt is affected by exchange rate fluctuations of the dollar vis-a-vis other Western currencies. Because most purchases are apparently made in non-dollar currencies, we have assumed that about 20 percent of this debt consists of dollars and the rest denominated in Deutschmarks, Yen, French Francs, and Pound Sterling in proportion to Soviet machinery purchases from those countries. In addition, the available data on commitments, apparently refers, in part, to offers of western credits for specific projects. The estimates of Soviet exposure—as measured by total commitments reported by the West—is inflated to the extent that Western credit commitments have not been matched by deliveries of, or in some cases, orders for Western equipment, pipe, or other products.

⁴ For details on government financing arrangements see Organization for Economic Co-operation, *The Export Credit Financing Systems in OECD Member Countries*, Paris, 1982.

SOVIET EFFORTS TO REVAMP THE FOREIGN TRADE SECTOR

By Joan F. McIntyre*

CONTENTS

	Page
I. Summary.....	489
II. Introduction.....	490
III. Foreign trade under Brezhnev.....	490
A. Reform efforts.....	490
B. Inefficient import procedures.....	491
C. Mediocre export performance.....	493
IV. Gorbachev's economic program and the role for trade.....	495
V. Recent initiatives.....	496
A. 1985: Setting the stage.....	496
B. 1986 foreign trade reorganization.....	497
C. Joint ventures with the West.....	500
D. Other initiatives.....	501
VI. Future directions.....	502

FIGURE

1. USSR: Exports of manufactured goods to the West.....	494
---	-----

TABLES

1. Soviet Ministries with direct access to foreign trade partners, as of 1 January 1987.....	498
2. Composition of the Foreign Economic Commission.....	499

I. SUMMARY

Gorbachev's efforts to restructure the Soviet economy have resulted in major changes to the foreign trade system. As of 1 January 1987, the Ministry of Foreign Trade's (MFT) monopoly over many trade transactions was broken as a number of ministries, associations, and enterprises were granted the right to conduct their own trade transactions. In addition, changes were made to the incentive structure to encourage greater participation of enterprises in producing for export. The Soviets have also launched an aggressive campaign to increase economic cooperation with Western firms, especially in the area of joint ventures. The leadership has passed regulations that will permit Western equity in the USSR for the first time since the early 1930's. The Soviets are also examining new approaches to their financial dealings and, in general, are attempting to increase their role in the international economy.

*Office of Soviet Analysis, Central Intelligence Agency. This paper was completed in February 1987.

These recent changes are unlikely to have much success in achieving the primary goals of expanding exports of manufactured goods and more effectively using Western technology. Although the reorganization will probably improve the operation of trade by removing the MFT as a cumbersome middleman, the changes do not remedy the lack of domestic incentives for producers, the irrational price structure, and the inadequate technological base that underlie the poor performance of Soviet manufactured goods in international markets. Such improvements are tied directly to the success of Gorbachev's efforts to restructure the domestic economy. Likewise, the establishment of joint ventures is likely to proceed slowly and, even if successful, is unlikely to have much of an impact on expanding exports of manufactured goods or effectively introducing Western technology beyond the individual ventures. With little improvement in the structure of Soviet trade, the USSR is apt to remain a minor actor in the international economy.

II. INTRODUCTION

The monopoly of foreign trade, established by Lenin and concentrated in the Ministry of Foreign Trade, has produced a number of inefficiencies that limit the USSR's potential gains from foreign trade. This system—which has separated the end users of imports and the producers of exports from their foreign counterparts—provided few effective incentives to encourage domestic enterprises either to rationally utilize imports or produce for export. Indeed, many of the structural inadequacies of the foreign trade system have merely reflected deeper problems within the entire economic system. While attempts have been made to overcome the deficiencies of the foreign trade sector, especially in the middle to late 1970's, the Ministry of Foreign Trade had until recently effectively fought off any efforts to dilute its authority over foreign trade.

The inertia during Brezhnev's final years and the immediate period following his death has given way to considerable efforts to improve the performance of the economic system, including the foreign trade sector. While these efforts have yet to produce any dramatic departure from past practices, they do reflect greater open-mindedness among the leadership. Recent initiatives on the foreign trade front include the restructuring of the foreign trade apparatus, proposing new forms of economic cooperation with Western firms, applying to participate in GATT, and new approaches to financial dealings in the West. Although these efforts seek to accomplish specific economic goals, leadership desires to create a trade structure that befits a large industrial nation and is less sensitive to world price fluctuations provide further impetus to Soviet actions.

III. FOREIGN TRADE UNDER BREZHNEV

A. REFORM EFFORTS

From the mid-1960's to the late 1970's, the USSR tried periodically to improve the functioning of their foreign trade apparatus. Driven by a desire to expand exports, especially of manufactured goods, the Soviets took a number of measures in the mid- to late-

1960's to expand their sales network in the West, increase participation of industrial ministries in foreign trade activities, and provide incentives to domestic producers to encourage production for export. Organizational changes within the MFT included:

Expanding the number of foreign trade organizations (FTOs) dealing with exports of manufactured goods—including a separate FTO to handle spare parts,

Establishing export councils by the FTOs to increase contact with industry representatives in planning and implementing foreign trade, particularly export plans,

Creating *zagranpostavkas* (organizations responsible for overseeing the noncommercial aspects of contract fulfillment including the observance of quality regulations, after-sales service, and installation work) within individual production ministries to centralize their foreign trade operations.

In addition, the Soviets began expanding the number of Soviet-owned firms in the West, which serve primarily to market and service Soviet exports, and introduced incentives for producers to increase exports, primarily through hard currency retention schemes.¹

Renewed efforts to improve the performance of the foreign trade structure began in the early 1970's and lasted through 1978. These efforts considered not only organizational changes but also new forms of economic cooperation with the West. While the Soviets toyed with the idea of joint ventures and leasing, their reluctance to permit long-term Western involvement limited interest to compensation or buyback arrangements with Western firms, primarily in the chemical and energy sectors.² Organizationally, a 1976 Politburo resolution called for a greater role for industries in foreign trade decisionmaking and other changes to increase the responsiveness of the FTOs and the ministries to foreign markets. These decisions, however, were not implemented until 1978 with the publication of two Council of Ministers' decrees outlining a limited reorganization of the MFT, particularly of the FTOs. Under these decrees import and export FTOs handling similar commodities were combined with these newly reorganized FTOs governed by a board of directors composed of representatives from industrial ministries, associations, enterprises, and FTOs.³ Nevertheless, the Soviet foreign trade sector remained highly centralized with all the accompanying shortcomings.

B. INEFFICIENT IMPORT PROCEDURES

While Western technology has made an appreciable difference to both the civilian and defense industries, the USSR has not been particularly successful in assimilating and diffusing technology. Performance of Western equipment and technology has often been

¹ For more details see Paul Ericson, "Soviet Efforts to Increase Exports of Manufactured Products to the West," *Soviet Economy in a New Perspective*, Joint Economic Committee of the Congress of the United States, Washington, D.C. Oct. 14, 1976.

² For more details see Dennis J. Barclay, "USSR: The Role of Compensation Agreements in Trade With the West," *Soviet Economy in a Time of Change*, Joint Economic Committee of the Congress of the United States, Washington, D.C. Oct. 10, 1979.

³ For more details see Scott Bozek, "The USSR: Intensifying the Development of Its Foreign Trade Structure," *Soviet Economy in a Time of Change*, Joint Economic Committee of the Congress of the United States, Washington, D.C. Oct. 10, 1979.

below levels comparable to that in a Western setting; Soviet manning of such equipment has been excessive compared with similar situations in the West and the frequency and duration of breakdowns have been much greater. Moreover, because of the time-consuming negotiation process and long delays in installing imported equipment, the technology was often effectively dated by the time operation commenced.⁴

Many of these inadequacies were due to the lack of contact between the end users and the FTOs and the conflicting goals of the two groups. FTO officials were held responsible for (1) demonstrating that they have met the demands of the industrial ministries for guarantees from the Western suppliers on delivery and on-site performance of imported equipment and detailed technical documentation and (2) obtaining the "best" terms available when negotiating contracts (that is, lowest price and availability of long-term loans carrying low nominal rates of interest). Such attempts to negotiate price reduction led to protracted negotiations, often two to three times longer than similar negotiations in the West, thus delaying the installation of needed technology. Furthermore, Soviet demands that extensive documentation be provided and adhered to allowed for little flexibility in changing the contract to adapt to new circumstances.

The criteria on which the performance of FTOs was judged further contributed to the system's shortcomings since it did not necessarily take into account the requirements of the end user. Although industrial ministries and associations had long been represented on FTO boards of directors and end users often participated in the initial technical discussions for large purchases, they were largely excluded from actual contract negotiations. In their efforts to secure what they considered a reasonable price, the FTOs often bargained away quality and important technical details. Consequently, purchases were made that did not reflect the specific requirements of the end user and at times could not even be used.

The Soviet system also provided few incentives to encourage the end user to effectively use imported technology. In fact, pressures to meet production targets discouraged the use of imported machinery and equipment (as well as innovations in general) because of the potential for disrupting current production. In addition, imported equipment was frequently delivered to a facility still under construction (because of chronic construction delays) and damaged by sitting outside, unprotected for a considerable length of time.

Moreover, Soviet reluctance to permit ongoing, meaningful ties between Western firms and end users of imported technology hindered full assimilation of Western technology. East-West industrial cooperation arrangements have been in existence for quite some time, but the Soviets limited their participation in such arrangements largely to the acquisition of equipment, often for complete plants, technical know-how, and some provisions for joint R&D. They used these arrangements to a much lesser extent than the East Europeans to obtain Western managerial services, quality con-

⁴ Hanson, Philip. *Trade and Technology Transfer in Soviet-Western Relations*. New York, Columbia University Press, 1981; and Rothlingshofer, Karl Ch. and Heinrich Vogel. "Soviet Absorption of Western Technology." Report for Stanford Research Institute, March 1979.

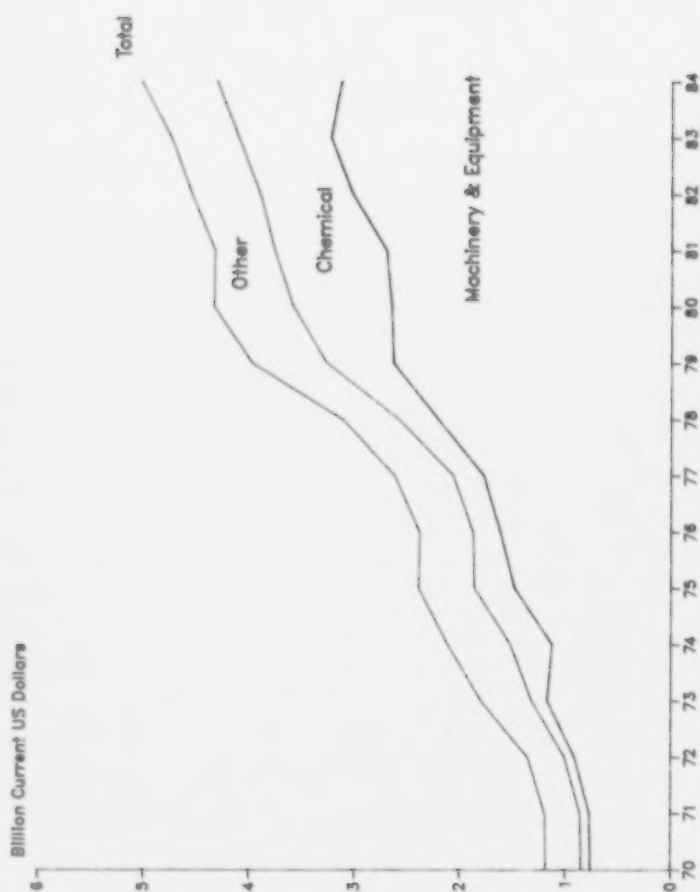
trol, and coproduction provisions—all of which required much closer contacts than the Soviets were willing to permit.⁵ Soviet unwillingness to allow on-site inspection by Western partners stymied efforts to negotiate compensation arrangements in machinery and equipment production. In addition, the lack of continual contacts that such arrangements afford prevented routine updating of production processes that the Soviets have acquired from abroad and made it difficult for Western firms to develop products and processes specifically suited to Soviet needs.

C. MEDIOCRE EXPORT PERFORMANCE

Soviet initiatives also failed to convert the USSR into a major exporter of manufactured commodities. In fact, the dramatic rise in energy prices resulted in the share of manufactured goods in total Soviet exports dropping from 38 percent in 1970 to 21 percent in 1984. These goods accounted for only 15 percent of total exports to non-Socialist countries in 1984. Furthermore, after a sustained growth of these exports to the West of about 14 percent per annum during the 1970's, exports of manufactured goods virtually stagnated in the 1980's (see figure). Moscow was particularly lackluster in expanding exports of machinery and equipment to the developed West. Most of these exports to the West went to the less developed countries and were often associated with Soviet development projects in those countries. Even in the LDCs, some of Moscow's customers such as India and Iraq have been looking elsewhere for machinery purchases that in the past have been made from the USSR.

⁵ Zaleski, Eugene and Helgert Wienert. *Technology Transfer between East and West*. Paris, Organization for Economic Co-operation and Development, 1980.

Figure 1
USSR: Exports of Manufactured Goods to the West



Key impediments to export growth remained the poor quality and outdated technology of many of manufactured exports. The Soviet system provided little incentive for manufacturers to produce for export. While the domestic enterprises were paid a higher price for goods produced for export to compensate for the extra costs required to meet export specifications, factory managers argued that the prices were not sufficient to cover the additional costs incurred. More important, the need to meet export specifications that differed from domestic standards interfered with the ability to meet output targets. The FTOs, on the other hand, preferred to keep the price paid to the producers as low as possible since their performance was measured by the profitability, that is, the difference between the price they paid the domestic producer and the price they received from the foreign customer.⁶

In addition, the right of enterprises to retain a portion of their hard currency earnings to purchase Western equipment and materials was largely ignored. The Bank for Foreign Trade (Vneshtorgbank) often dragged its feet and even refused to allocate hard currency which was technically owned by the enterprises. As with other imports, purchases made with these funds had to be put into the plan and carried out through the relevant FTO, thus offering little advantage to the exporting enterprise.

IV. THE ROLE OF TRADE IN GORBACHEV'S ECONOMIC PROGRAM

Since Gorbachev became General Secretary in March 1985, official pronouncements on the importance of employing new technologies to modernize industries have become more urgent. Gorbachev has emphasized that it is the same high-technology industries in the West—machine tools, robots, microelectronics, computers, and telecommunications—that must now lead the way in the USSR. He had made it clear that scientific and technological (S&T) progress in these industries is critical to the production of better machinery, and when spread throughout industry, such progress will spur economic growth to levels where adequate living standards, defense capabilities, and investment can be maintained.⁷

The ambitious production targets set by Gorbachev, especially for increases in the machine-building sector, will be difficult, if not impossible, to meet without increased imports of machinery and equipment, as well as a more effective use of such imports than has been the case.⁸ The Soviets undoubtedly expect that increased imports of higher quality machinery and equipment from Eastern Europe will supplement domestic production. For over a decade, the Soviets have pushed hard within the Council for Mutual Economic Assistance (CEMA) to integrate more closely the Soviet and East European economies and to raise the quality of the goods they produce to world standards. These efforts have intensified under Gorbachev as is evidenced by the conclusion of specific long-term

⁶ Gardner, H. Stephen. *Soviet Foreign Trade: The Decision Process*. Boston, Kluwer-Nijhoff Publishing, 1983.

⁷ For example see Gorbachev's 11 June speech at a conference on scientific and technical progress. The most complete version was published in *Kommunist* No. 9, June 1985.

⁸ For more details see Kreshover, Douglas. "Gorbachev and the Economy: The Developing Game Plan," in this compendium.

S&T agreements and the push for establishing joint production associations.

Soviet attitude toward trade with the West has been much more ambivalent. Soviet disillusionment with Western technology, owing to the failure of such imports to make the expected contributions to industrial outputs, began in the late 1970's and has carried over into the Gorbachev regime. Ryzhkov, at the June 1986 Supreme Soviet meeting, chided economic leaders who continue to "seek to resolve their problems through imports, without taking state interests into account."⁹ In his September 1985 interview with *TIME* magazine, Gorbachev stressed that Soviet modernization goals are to be achieved through domestic S&T progress (presumably including results from CEMA cooperation) rather than transfusion of US (i.e. Western) technology.¹⁰ As long as oil prices remain low and Moscow retains its conservative approach to borrowing, the USSR will have little choice but to hold imports below the levels reached in the early 1980's, thus reinforcing Soviet intentions of relying primarily on domestic resources for S&T advancement and modernization.¹¹

Although a significant growth in Western imports does not at present appear to be in Soviet plans, Soviet leaders, including Gorbachev, have nonetheless spoken frequently of the need to adopt a new approach to their foreign economic strategy and to develop new forms of economic cooperation. In this regard the Soviets are now discussing openly opportunities for joint ventures with Western firms and are again emphasizing efforts to expand exports of manufactured goods, particularly machinery and equipment. In his speech on the 12th Five-Year Plan at the June 1986 Supreme Soviet meeting, Ryzhkov stated that exports of machinery and equipment are planned to increase by 70 percent over the period. To achieve this goal, he stated, "we obviously need to develop the economic machinery and educate economic cadres in such a way that their import requirements are strictly in accordance with their export potential."¹² Moscow's rejuvenated approach to trade with the West is aimed at improving the effectiveness of foreign trade in the domestic economy and raising the stature of the USSR in the international arena.¹³

V. RECENT INITIATIVES

A. 1985: SETTING THE STAGE

While no major changes occurred in 1985, it marked the beginning of Gorbachev's efforts to improve the performance of foreign trade, especially of exports. Most of these efforts were aimed at improving the quality, technological level, and efficiency of domestic production of machinery. A Central Committee decree issued in

⁹ *Pravda*, 19 June 1986.

¹⁰ *TIME*, Sept. 9, 1985, pp. 22-29.

¹¹ See McIntyre, Joan F., "Soviet Hard Currency Trade: A Balance of Payments Perspective" in this compendium.

¹² *Pravda*, 19 June 1986.

¹³ Although many of the changes being made to the foreign trade apparatus are directed at improving East-East trade, this paper focuses on the implications of the changes for East-West trade.

July 1985 dealt with measures to speed up scientific and technological progress, including some minor changes in the foreign trade system. In general, the decree called on ministries, associations, and enterprises to improve the competitiveness of Soviet exports by raising the technical level and quality of exportable products through expansion of current export incentive programs.¹⁴ Specific measures included in the decree were:

Increases of up to 20 percent on current supplements to the wholesale price for machinery, equipment, and related spare parts that are exported to hard currency countries, starting in 1986.

Assurances that Soviet enterprises will have access to foreign currency that they have earned from the delivery of export products.¹⁵

A more novel approach was the experiment announced in July 1985 at the Fiat-built Tol'yatti Automotive plant. Under this experiment, managers have been given greater responsibility in planning and control over earnings and spending. As part of the experiment, the plant can retain 40 percent of its hard currency earnings with apparently a greater degree of freedom than in the past in determining what shall be imported and when.¹⁶ The 1986 reorganization of the foreign trade apparatus (discussed below) expanded or, at least, formalized the amount of control that this enterprise now has over foreign trade.

Perhaps a more important precursor for the changes to come were the personnel moves made within the foreign trade structure. In October 1985, Nikolay Patolichev, who had been Foreign Trade Minister for 27 years, was replaced by Boris Aristov, a party apparatchik with no formal ties to the trade bureaucracy and thus more likely to be receptive to changes to the foreign trade apparatus. In addition, about half of the deputy ministers for foreign trade have been replaced since mid-1985. Likewise, the appointments of Nikolay Ryzhkov as Chairman of the Council of Ministers and Nikolay Talyzin as Gosplan Chairman removed major bureaucratic impediments within the upper level of the government hierarchy to potential changes in the planning and implementation of more innovative foreign trade activities.

B. 1986 FOREIGN TRADE REORGANIZATION

In late September 1986, the Soviets announced a major overhaul of the foreign trade apparatus aimed at correcting many of the problems that have plagued the system for decades. For the first time, the Soviet leadership introduced changes clearly intended to break the MFT's monopoly over foreign trade. Starting on January 1, 1987, more than twenty ministries and seventy large associations and enterprises were granted authority to conduct trade directly with their foreign partners. To carry out this trade, the ministries and production associations were granted jurisdiction over foreign

¹⁴ Associations are groups of enterprises, including factories, research institutes, and design bureaus, that are centrally managed to produce a product line or several related product lines.

¹⁵ Published in *Ekonomicheskaya Gazeta*, No. 32, August 1985.

¹⁶ *Izvestia*, July 28, 1985, p. 2.

trade organizations, many of which have been transferred from the MFT.

Included in the list of ministries which have been granted the right to conduct trade directly are the State Agroindustrial Committee (Gosagroprom), the State Committee for Material and Technical Supplies (Gossnab), the Ministry of Chemical Industry, and most machine-building industries, although their precise roles have not yet been defined (see table 1). The Soviets have indicated that the MFT will continue to control trade in raw materials, food, and about 60 percent of machinery imports. It is expected that in time additional ministries and enterprises will be granted autonomy over their trade transactions.¹⁷

TABLE 1.—*Soviet Ministries with direct access to foreign trade partners as of 1 January 1987*

STATE COMMITTEES

Gossnab (State Committee for Material and Technical Supplies)
Gosagroprom (State Agroindustrial Committee)
GKNT (State Committee for Science and Technology)¹
Goskomsport (State Sports Committee)¹
Goskomizdat (State Publishing Committee)¹

MACHINE-BUILDING MINISTRIES

Minenergomash (Ministry for Power Engineering)
Mintyazhmash (Ministry of Heavy Machine-Building Industries)
Minelektrotekhprom (Ministry of Electrical Equipment Industry)
Minavtoprom (Ministry of Automotive Industry)
Minselkhoz mash (Ministry of Machine-Building for Agriculture)
Minpribor (Ministry for Instrument Making and Automation)
Minstankoprom (Ministry for Machine-tool Building Industries)
Minkhimmash (Ministry of Chemical and Petroleum Machine-Building)

OTHER

Mirmorflot (Ministry of Merchant Marine)¹
Minrybkhov (Ministry of Fisheries)¹
Mingeo (Ministry of Geology)
GUGK (Main Administration of Geodesy and Cartography)
Minkhimprom (Ministry of Chemical Industry)
Minstroimaterialov (Ministry of Building Materials Industry)
Minmedbioprom (Ministry of Medical and Biological Industries)
Tsentsosoyuz (The Central Union of Consumer Cooperatives)¹

¹ Entities already having some control over their foreign economic relations.

Source: *Ecotass* No. 42, Oct. 20, 1986, pp. 3-11.

Under the reorganization, the relationship between the FTOs and enterprises and associations has been put on a contract basis in contrast to the previous system of orders issued for the delivery of specified goods required to fulfill the plan. In particular, organizations without the right to conduct their own trade transactions can now negotiate the best export terms for their products to ensure the highest possible currency earnings. The FTOs for their part are to receive a commission for their services based on the size of the transaction. At the same time, foreign trade planning is to be improved and targets for currency earnings, including for hard currency, and the development of international production sharing have been introduced as indicators of plan fulfillment for minis-

¹⁷ *Ecotass* No. 42, Oct. 20, 1986, pp. 3-11 and *Financial Times*, Nov. 11, 1986.

tries, FTOs, and enterprises and associations with the right to conduct foreign trade. These changes should provide further incentive for producers to take a more active interest in expanding their trade.

According to the Council of Ministers' resolution, published in January 1987, currency allocations for enterprises, associations, and organizations are to be created from the sale of their finished products and services and from "earnings from shared production delivery operations"—presumably referring to sales of raw materials. These funds are to be used to purchase machinery, licenses, and designs to modernize their facilities, with an emphasis on expanding exports. Failure to meet export targets, however, are to result in a reduction in allocated funds. Vneshtorgbank has also been granted the right to extend credits to enterprises for imports. USSR ministries and departments and union republic councils of ministers are authorized to centralize up to 10 percent of allocated funds to assist producers in developing exports and to finance trade transactions.¹⁸ While in theory, these changes decentralize much of the decision-making authority for imports, as long as the USSR remains largely dependent on exports of raw materials, the central planners will continue to control trade operations through the distribution of earnings from these exports.

As part of the reorganization, the Soviets have also created a coordinating commission, the State Foreign Economic Commission, composed of the heads of the major ministries and departments engaged in trade activities (see table 2). The commission, headed by V.M. Kamentsev, is to provide strategic guidance to the foreign trade sector; its command over resources, however, appears to be far less than that accorded to the state committees formed to oversee agriculture and construction. The MFT and the State Committee for Economic Relations (GKES) are to continue to monitor foreign trade operations but, at least for the MFT, with reduced power. GKES, on the other hand, is to oversee cooperation projects on Soviet territory in addition to construction projects overseas. Vneshtorgbank appears to have gained a greater role in controlling the distribution of scarce hard currency.

TABLE 2.—*Composition of Foreign Economic Relations Committee*

Chairman: Deputy Chairman of the USSR Council of Ministers.

First Deputy Chairman: Deputy Chairman of the Council of Ministers who is the USSR Representative to CEMA.

Deputy Chairman: Chairman of the Commission's Combined Economic Department.

Deputy Chairman: Chairman of the Commission's Scientific Economic Council.

OTHER MEMBERS

State Committee for Science and Technology: Chairman.

Ministry of Foreign Trade: Minister.

Gossnab: First Deputy Chairman for General Questions.

State Committee for Foreign Economic Relations: Chairman.

Gosplan: First Deputy Chairman.

Ministry of Finance: Minister.

Ministry of Foreign Affairs: Deputy Minister.

¹⁸ *Ekonomicheskaya Gazeta*, No. 4, January 1987, pp. 3-4.

Also included as members are the first deputy chiefs of the Council of Ministers' standing organs.

Source: *Ekonomicheskaya Gazeta*, No. 4, January 1987, pp. 3-4.

C. JOINT VENTURES WITH THE WEST

Moscow is actively pursuing the establishment of joint-equity ventures with many of its Western trading partners. In January 1987, a Council of Ministers resolution was issued which formally set the guidelines for such ventures. These guidelines authorize up to 49-percent foreign equity and allow for repatriation of profits and "meaningful participation" of the foreign partner in the management of the venture. Capital contributions from the West are to take the form of equipment, technology, or financing while spending for "social infrastructure" will be taken into account when calculating the Soviet share. Management of the joint venture will consist of a board, with Soviets occupying the positions of chairman of the board and director-general.

Furthermore, production plans for joint ventures will not be centrally determined and purchases are to be conducted through foreign trade organizations with prices set at world levels. Thus, these ventures will be essentially isolated from the rest of the economy, even though they will be required to abide by Soviet law in setting wages, hour of work, and vacation time for Soviet employees.¹⁹ While the Soviets have set these general guidelines, many of the specifics remain vague and the Soviets could still be flexible in negotiating the details.

The Soviets probably see several advantages to such arrangements.

Partnership with a Western firm would provide access to established markets and trademarks that could make it easier to sell Soviet-made goods in the West.

Quality control by the Western partner would help assure that products meet world market standards.

A long-term equity relationship with a Western firm could allow for automatic updating of production lines to keep up with changing Western demands and technology.

Joint ventures would allow for transfer of technical know-how related to organization and management of production and the use of advanced technology that are not easily transferred through traditional equipment purchases.

Such arrangements would allow for the transfer of Western technology at little or no hard currency cost to the Soviets until after production begins.

The Soviets are interested in establishing joint ventures in the manufacture of chemicals, machine-building, wood processing, electronics, communications, computer-aided design, petroleum-refining and petrochemical industries, construction materials, and light and food industries. Japanese companies have already submitted proposals for joint ventures in lumber processing, marine products, and food industries. While the Soviets see import-substitution as an important goal for establishing joint ventures, they are requiring that all hard currency expenditures, including the repatriation of

¹⁹ *Ecotass* No. 42, Oct. 20, 1986 and *Ecotass* No. 2, Jan. 19, 1987.

profits, be generated from exports, thus making the ability to export the most important criteria for all practical purposes.

While joint ventures with the West appear to be the current buzzword among Soviet officials, there are several other types of arrangements that they could pursue that would provide many of the same advantages. For example, buyback and coproduction arrangements could allow for access to Western markets, quality control, hard currency savings, and improved access to Western technology but with less direct Western involvement. Indeed, many of the discussions under the rubric of "joint ventures" could be little more than coproduction or buyback arrangements in the manufacturing sectors.

Purchase of Western management services could also improve Soviet efficiency in introducing new technological processes and organizing production. Such arrangements should be particularly attractive to the Soviets in the key sectors of the economy where they might desire to limit the extent of Western involvement such as in agriculture and the development of raw materials.

D. OTHER INITIATIVES

In tandem with recent moves on the trade front, Gorbachev's financial managers have taken some tentative steps that indicate a greater interest in utilizing the wide range of Western financial markets and instruments to improve the effectiveness of their borrowing activities.²⁰ Traditionally, the Soviets have relied heavily on Eurocurrency borrowings, promissory-note financing, and government-backed credits. In 1985, however, the Soviets agreed to an acceptance facility—a financing technique in which the bank guarantees payment to exporters for trade documents—with U.S. and Canadian bankers for grain purchases. In August 1986, Vneshtorgbank arranged a 100 million pound sterling acceptance led by a British bank, the first time the Bank of England has permitted the Soviets to borrow in this manner. Moscow Narodny Bank, the Soviet-owned bank based in London, put together a "note issuance facility" (NIF), a new instrument incorporating an option to issue notes as well as raise funds through cash advance.

The Soviets have also made unprecedented moves in world bond markets. In August 1986, Vneshtorgbank agreed to invest \$3.2 million in a yen-denominated bond issue, marking the first entry of the USSR into the international bond market. Most financial analysts believe that this venture is an indicator of Moscow's interest in marketing its own bond issues, a cheaper source of long-term funds than syndicated borrowing. The settlement with the British in July 1986 on Tsarist bonds in default since 1917 removes a long-standing impediment to the issuance of Soviet bonds.

The Soviets are exploring the possibilities of expanding ties with some multilateral economic institutions, especially the General Agreement on Tariffs and Trade (GATT) in hopes of expanding trade opportunities. They apparently believe that membership in, or at least association with, the GATT will improve their general

²⁰ For more details on Soviet financial policy see Brainard, Lawrence J., "Soviet International Financial Policy: Traditional Formulas or New Innovations" in this compendium.

knowledge of world economic conditions and help integrate the USSR into the international economy. Moreover, they would like to boost exports by making their goods eligible for tariff reductions.

Meeting GATT membership criteria will prove difficult, however. Although Soviet officials argue that the recent reorganization of the foreign trade sector make the Soviet economy more compatible with the aims of the GATT, crucial trade decisions still remain centrally controlled. Thus, the Soviets have still not accepted the concept of free trade and international competition which form the basis of GATT. Lacking meaningful tariffs or quota systems, the Soviets also have few direct concessions that they can offer in return for accession to the GATT. Like other centrally planned economies that have acceded to the GATT, such as Poland and Romania, Soviet concessions would have to incorporate commitments to increase imports from GATT signatories. The Soviets would have difficulty meeting such commitments, however, given current hard currency problems.

While there has been some talk of Soviet interest in the IMF, Soviet officials do not appear anxious at the moment to establish relations with this organization. The USSR rejected IMF membership as too restrictive after participating in the organizing meetings at Bretton Woods in 1944. In particular, the USSR was unwilling to give up autonomy in setting their own trade and exchange rate practices, did not agree with the gold subscription requirements, and refused to release sensitive economic data such as gold reserves and balance-of-payments information. These factors are likely to continue to contribute to the Soviet lack of interest in the organization.

VI. FUTURE DIRECTIONS

At present, Soviet actions are directed toward improving the operation of the foreign trade sector, expanding exports, and improving the management of financial dealings. Such efforts are likely to be constrained by a lack of Soviet expertise in how the international economy operates. As the new Soviet leaders gain more expertise, we can expect them to be more forthcoming with new initiatives. How active they become in the international economic arena will depend primarily on the success of their initial efforts to improve the structure and operation of trade.

Progress in the establishment of joint ventures is apt to be slow. While some Western firms may be willing to make a relatively small investment to gain entry into the Soviet market, most are likely to take a wait-and-see attitude. Years of dealing with cumbersome Soviet bureaucracies, shoddy Soviet manufactures, and unimpressive results from joint ventures with other socialist countries will make most businessmen wary. The Soviets themselves are apt to approach actual negotiations cautiously. Granting the amount of Western control over production decisions that would be required by the Western parties would go against the grain of most Soviet managers.

Even if impediments to successful joint ventures can be overcome, the level of investment is likely to be too small to have much of an impact on expanding Soviet exports of manufactured goods.

Nor will the recent changes in the foreign trade apparatus likely have much success in expanding exports. Although they will probably improve the operation of trade, at least for some transactions, by removing the MFT as a cumbersome middleman, the changes do not remedy the lack of domestic incentives for producers, the irrational price structure, and the inadequate technological base that underlie the poor position of Soviet manufactured goods in world markets.²¹ In addition, depressed earnings from traditional exports will severely constrain purchases of foreign equipment that could compensate for some of these shortfalls.

Some of the changes proposed in the foreign trade arena could prove to be counterproductive. By making export potential an important criteria in determining imports of machinery and equipment, hard currency resources could be diverted away from priority sectors of the economy. For example, most Western firms are likely to be most attracted to coproduction or joint venture projects that would produce low-level technology items where quality factors are less likely to be a problem than the high technology areas that the Soviets are most interested in expanding. At the enterprise level, hard currency retention schemes are most likely to benefit efficient producers at the expense of less efficient producers who would likely benefit more from increased Western imports.

Overall, the Soviets are likely to move steadily but cautiously into the international economic arena. They will probably become more adaptable to new financial instruments, but the present limitations on Moscow's hard currency earnings, coupled with vestiges of traditional Soviet conservatism, are likely to restrict sharply any large-scale speculative approaches to financial management. The USSR will also probably remain interested in the GATT and may make approaches to other multilateral economic organizations. Nevertheless, given the problems enumerated above, the USSR is apt to remain a relatively minor actor in the international economic arena.

²¹ Indeed, success in increasing the effectiveness of foreign trade will be intrinsically linked to Moscow's ability to improve the performance of the economy as a whole. Unless sufficient incentive is provided to domestic producers to successfully incorporate imported technology in domestic manufactures and to produce high quality goods, the impact of any improvements in the handling of import and export transactions will be minimal.

SOVIET TRADE WITH LDC'S

By Marie Lavigne*

CONTENTS

	Page
Summary	504
I. The Soviet attitude toward relations with LDCs	505
II. Trends and geographical pattern of Soviet-LDC trade	507
A. The "residual" in Soviet exports	509
B. The regional structure of trade	510
C. The main partners	514
III. Commodity composition of trade	518
A. The Soviet exports	518
B. The Soviet imports	524
1. The priority to food imports	525
2. Raw materials: The roads to co-operation	526
3. The oil trade: Is reexport still rewarding?	527
4. The manufacturing goods trade	528
IV. Trade balances and gains from trade	529

TABLES

1. USSR-Third World trade: General trends, 1970-1985	508
2. Growth of Soviet-LDC trade, in current and in constant prices, 1970-1985	509
3. Geographical distribution of Soviet-LDC trade, 1970-1985	511
4. Ranking of individual countries in Soviet trade with the Third World, 1980 to 1985	515
5A. Trade of the USSR with the developing countries, total, commodity composition (in percent of total trade)	519
B. Trade of the USSR with OPEC countries, commodity composition (in percent of total trade)	521
C. Trade of the USSR with the developing countries of Asia (Middle East excluded), commodity composition (in percent of total trade)	521
D. Trade of the USSR with the developing countries of Latin America (Latin American Integration Association), commodity composition (in percent of total trade)	522
E. Trade of the USSR with the developing countries of Africa, commodity composition (in percent of total trade)	523
6. Soviet imports of coffee, cocoa and tea from Third World suppliers, 1980-85	525

SUMMARY

The Soviet Union is increasingly taking into account its economic interests when trading with the Third World. These interests are to be pursued on the basis of "mutual advantage", even with the countries which matter most from the political and strategic point of view. This shift has been obvious in Soviet thinking since the end of the seventies. The new external constraint brought about by the fall in oil prices raises new questions: will the Soviet Union be

*Professor of Economics, University of Paris I.

able to maintain its hard currency surpluses with the oil exporting countries, at the same time as its own gains from oil sales to developed countries are fading?*

Since Gorbachev's accession to power, no dramatic shifts have occurred in the overall trends in Soviet-LDC trade, either in the geopolitical distribution of Soviet trade partners or in the commodity composition of this trade. However, two significant facts emerge from the events of 1986.

The first one is the rising importance of the "countries with a socialist orientation" in the Soviet visible (i.e. identified by partners) exports. For the first time, these countries accounted for more than a half of Soviet identified sales to the Third World in 1986. This would at first glance challenge the assumption according to which the USSR is looking for gains, more than for influence, in its trade with LDCs. It seems, however, that both aims are increasingly compatible, or at least pursued simultaneously.

The second is a striving towards hard currency surpluses. In a first step it has been achieved through direct quantitative measures (pushing exports in volume, especially for arms and machinery, reducing imports, with the very lucky occurrence of a good import-saving harvest in the USSR).

It seems, however, that the Soviet Union is seeking a deeper restructuring of its trade with LDCs, with more value-added goods on the export side (which would mean a lasting reduction in the share of oil), and more import-substitution upgrading manufactures purchases from the Third World. But as in Soviet trade with the developed world, the new trends originating from the hard currency constraint which emerged in 1986, and from the subsequent reforms of the foreign trade mechanism, are still to be confirmed.

Before elaborating on this, let us state that we are using here the wording "LDCs" (less developed countries) or "Third World" with the coverage given by the Soviet Union to "developing countries", which excludes the developing socialist countries (Cuba, Vietnam, Mongolia, Laos, North Korea, Kampuchea, and of course China).

I. THE SOVIET ATTITUDE TOWARD RELATIONS WITH LDCs

Western observers have noted that the Soviet Union has been shifting toward an evaluation of its purely economic interests in trade with the Third World, from an attitude dominated by the consideration of strategic and political interests (Valkenier, 1983; Smith in Cassen, 1985). This shift is indeed obvious since the mid-seventies. It may be explained by two main factors.

First, while for a long time (from the mid-fifties to the end of the sixties) it was expected that sooner or later most of the developing world would take a "socialist path of development", for more than a decade now, there is a clear perception of the fact that the majority of developing countries are indeed anchored in capitalism. Second, even for the group that is following a "socialist orienta-

*This article has been written as part of a research project on East-South economic relations, conducted in the "East-South" Group of the Centre for International Economics of Socialist Countries at the University of Paris I Pantheon Sorbonne. The work of the Group has been published in the form of a book in French (Lavigne, ed., 1986) and is being expanded in a version in English to be published by Westview Press in 1987 *East-South Relations in the World Economy*.

tion", the costs associated with economic assistance are increasingly felt as a burden, and regarding the other LDCs there is a stronger tendency to seek economic benefits from co-operation.

The first point is stressed in recent Soviet literature and in official documents of the Gorbachev period. Academician Bogomolov (1986, p. 305) states that—

it would be incorrect to say that the relations between the socialist world and the developing countries are based upon the principle of socialist solidarity. No. We deal with states which in their majority follow a capitalist path of development, and only a few of them cling to a "socialist orientation". This is why one cannot speak of a class solidarity between these states and the socialist world.

It follows that the developing world is heterogeneous in its nature. The dividing line between "socialist" and "capitalist" orientation is not sufficient to account for this diversity. A book published in 1983 by the Institute of World Economics and International Relations (IMEMO in Russian) begins with recalling the traditional distinction, but admits that the "socialist orientation" is not automatic. Each developing country "may be treated as a social organism which is evolving in its integrity with its own logic and its own socio-genetic code" (Aleshin and al., eds., p. 7). In the same book a Soviet author known for his commitment to a "multicriterial approach" of the LDCs, V.L. Sheinis, elaborates on a classification of these countries along economic criteria (GNP per capita, industrial structure, natural resources endowment, rates of growth, etc.).

This implies that the policies followed should be different, with a definite emphasis on the economic interests as far as the "capitalist" set of LDCs is concerned. The new Program of the Communist Party of the Soviet Union, adopted at the XXVIIIth Congress (March 1986) draws a difference in treatment between the developing world in general (to which the Soviet Union is "sympathetic", supporting "the struggle of these countries against the neo-colonial policy of imperialism"), and the countries with a socialist orientation. The latter are to benefit from "solidarity, political and economic co-operation", but even to them the Soviet assistance will be provided "according to the capacities" (of the USSR). This does not preclude some co-operation with the countries "which follow a capitalist way" (the very concept is mentioned as such for the first time in an official Soviet document). The caution in assessing the economic side of Soviet-Third World relations in the Program strongly contrasts with the firm commitments in the political sphere.

In the same line, Bogomolov (1986, p. 320) draws a clear distinction between "those countries which play the most active role in the national liberation struggle, keep to a progressive political orientation", and the others:

For instance, we witness a successful development in economic and technical co-operation of the CMEA countries with Angola, Algeria, Afghanistan, Syria, Ethiopia, etc. Being at the forefront of the anti-imperialist struggle, they see natural allies in the socialist states, which creates a favorable basis for economic co-operation also.

The second stage of the argument leads to an assessment of sought-after benefits. This is candidly expressed in a book published in 1985 on USSR-LDC trade and economic relations (Belchuk, ed., p. 122):

Up to the beginning of the seventies, the USSR and the other socialist countries paid special attention, in their credit policy toward the DCs, to the development of sectors and enterprises meant to satisfy mainly the domestic needs of those countries. As to the aims of providing the creditor countries with import goods in an economically advantageous way, and of forming long-lasting commercial and economic links between the two groups of countries, there were no adequate conditions at that time . . . Now there are objective conditions for that . . . It is of particular importance to evaluate the economic efficiency of the credit links between the Soviet Union and the developing countries, and to point at possible ways to improve them.

The same had already been stressed in a book on countries with a socialist orientation, published in 1980 (Ushakova, 1980, p. 24):

There may be a situation when the co-operation with a given country is efficient from the point of view of its contribution to a strengthening of the socialist orientation, but does not provide direct economic results. This is a twist to the principle of mutual advantage, which sometimes may have a lasting character in the economic co-operation with the countries of this group. However, one has to take into account the fact that with the strengthening and deepening of the socialist orientation, in particular due to the help of the socialist countries, conditions are emerging for a gradual shift toward a mutually advantageous co-operation, keeping in mind the long term interests of the less developed partner.

In summary, these statements point to the legitimacy, for the Soviet Union, to derive economic advantage from its relations with the LDCs without harming the interests of the latter. How is it to be achieved? A closer examination of the recent trends in Soviet-LDC trade helps to identify the ways and means of enhancing the economic benefits of mutual trade.

II. TRENDS AND GEOGRAPHICAL PATTERN OF SOVIET-LDC TRADE

During the seventies, trade of the USSR with the LDCs followed a trend largely similar to its total trade, which is confirmed by the great stability of the share of the LDCs in total Soviet trade (in average, 15 percent of total Soviet exports, and 11 percent of total imports: see table 1). This contrasts with the trends observed for the six Eastern European countries, whose trade with the LDCs has definitely been more dynamic than overall trade over this period (Lavigne, 1986). However, the basic strategy may well be identical. Like the Six, the USSR is striving to maintain a surplus in its trade with the Third World. The faster growth of East-South trade, in the case of the Six, mainly expresses the failure of Eastern Europe to increase its trade with the West, while Soviet-Western trade was sustained in the seventies by the growing prices for fuels.

TABLE 1.—USSR-THIRD WORLD TRADE: GENERAL TRENDS, 1970-85

(Values, in millions of dollars)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Total trade (world):																
X	12,800.0	13,806.1	15,361.1	21,462.3	27,403.8	33,315.5	37,169.6	45,159.2	52,219.5	64,751.3	76,449.5	79,002.9	86,911.9	91,334.6	91,370.0	86,956.4
M	11,731.6	12,479.8	16,054.5	21,112.3	24,883.9	36,970.8	38,111.2	40,811.7	50,546.4	57,770.7	68,522.5	72,959.8	77,751.8	80,266.9	80,075.9	82,922.3
B	1,068.4	1,326.3	-693.4	350.0	2,519.9	-3,655.3	-941.6	4,347.5	1,673.1	6,990.6	7,927.0	6,043.1	9,160.1	11,067.7	11,094.1	4,034.1
Total trade (Third World):																
X	2,039.6	2,030.2	2,422.1	3,985.7	4,478.0	4,588.3	4,960.9	7,247.0	8,401.8	9,603.3	10,580.9	11,993.1	14,149.9	14,157.7	13,386.8	11,521.8
M	1,272.9	1,411.9	1,628.5	2,361.4	3,150.6	4,156.9	3,720.7	4,064.8	4,154.0	4,863.8	7,847.4	10,781.2	9,316.9	9,665.0	9,297.1	9,149.0
B	766.7	618.3	793.6	1,624.3	1,327.4	431.4	1,240.2	3,182.2	4,247.8	4,739.5	2,733.5	1,211.9	4,833.0	4,492.7	4,089.7	2,372.8
In percent of trade with world:																
X	15.9	14.7	15.8	18.6	16.3	13.8	13.3	16.1	16.1	14.8	13.8	15.2	16.1	15.5	14.7	13.3
M	10.9	1.3	10.1	1.2	12.7	11.2	9.8	10.0	8.2	8.4	11.5	14.8	11.9	12.0	11.5	11.0
Trade with identified LDCs:																
X	1,241.4	1,330.1	1,357.3	1,840.0	2,452.3	2,707.1	2,642.1	3,365.0	4,187.3	5,259.8	5,798.7	6,995.6	7,580.4	7,161.4	6,557.7	6,384.8
M	1,241.3	1,389.6	1,614.9	2,338.5	3,120.3	4,145.7	3,687.7	4,006.9	4,090.6	4,823.7	7,680.2	10,606.8	9,129.4	9,398.4	9,182.7	9,060.0
B	0.1	-59.5	-257.6	-498.5	-668.0	-1,438.6	-1,045.6	-641.9	96.7	436.1	-1,881.5	-3,607.2	-1,549.0	-2,237.0	-2,625.0	-2,675.2
R	798.2	700.1	1,064.8	2,145.7	2,025.7	1,881.2	2,318.8	3,882.0	4,214.5	4,343.5	4,782.2	4,993.5	6,569.5	6,996.3	6,829.1	5,137.0
%R	39.1	34.5	44.0	53.8	45.2	41.0	46.7	53.6	50.2	45.2	45.2	41.6	46.4	49.4	51.0	44.6
In percent of trade with Third World:																
X	60.9	65.5	56.0	46.2	54.8	59.0	53.3	46.4	49.8	54.8	54.8	58.4	53.6	50.6	49.0	55.4
M	97.5	98.4	99.2	99.0	99.0	99.7	99.1	98.6	98.5	99.2	97.9	98.4	98.0	97.2	98.8	99.0

Methodological note. The data used in tables 1, 3, 4, have been taken from the Databank CRIES (Calculs sur les Relations Internationales des Economies Socialistes) of the Centre for International Economics of Socialist Countries, (February 1987 ed.). The figures have been computed on the basis of the official Soviet foreign trade statistics (from "Vneshnaya Torgovlya SSSR"). For the conversion in dollars, the average annual conversion rates published in the UN "Monthly Bulletin of Statistics" have been used.

Symbols used: X = Exports; M = Imports; B = Balance; R = Residual (difference between exports to the LDCs and exports to identified Third World countries); %R = Ratio between the residual and the total exports to the LDCs, in percent.

TABLE 2.—GROWTH OF SOVIET-LDC TRADE, IN CURRENT AND IN CONSTANT PRICES 1970-85

(Average annual change, in percent)

	1971-75	1976-80	1981	1982	1983	1984	1985	1986 ¹
A. In current prices								
Trade with LDCs:								
X.....	17.7	18.3	13.3	18.0	0.1	-5.4	-13.8	9.3
M.....	26.8	13.6	37.5	-13.6	3.7	-3.8	-1.5	-23.3
Trade with world:								
X.....	21.0	18.8	3.3	10.0	5.1	0.6	-5.3	11.4
M.....	24.1	12.5	6.5	6.6	3.2	-0.3	3.7	7.9
B. In constant prices								
Trade with LDCs:								
X.....	3.8	7.8	14.7	(X+M)	(X+M)	(X+M)	(X+M)	
M.....	9.8	2.9	33.8	10.4	3.7	0.0	0.0	
Trade with world:								
X.....	4.9	4.8	0.4	(X+M)	(X+M)	(X+M)	(X+M)	
M.....	10.4	5.8	8.2	8.1	4.1	3.2	0.0	

¹ 9 months

Sources: For data in current prices, the same as in table 1; for data in constant prices: "Vneshniaia Torgovlia SSSR 1922-1981," special volume, p. 30-31; "Narodnoe Khoziaistvo SSSR v 1985 godu," p. 575.

In the first part of the eighties, the downward trend of the growth rates on the export side was matched with an absolute decline on the import side following an exceptional growth of Soviet imports achieved in 1981. In 1986 the slump in imports sharply accelerated according to preliminary data for the first 9 months (by 23 per cent). As a result, the share of the Third World in total Soviet trade reached 10 percent in 1986, its lowest figure since the beginning of the sixties. The bias introduced by the fall in oil prices has to be accounted for, as the trends are calculated in current prices. In 1986 the Soviet exports to the Third World grew at a high rate, especially on the side of the "residual" trade (see below). Thus the decline in the overall share of the Third World in Soviet trade is entirely due to the drop in Soviet imports (in value).

The picture is different when one looks at volume data. The USSR does not regularly publish a detailed volume index of its trade with the non-socialist countries separately for the DME (developed market economies) and the LDCs. Table 2 sums up the evolution of trade with the Third World in value and in volume, using volume data which have been published up to 1981 for exports and imports separately, and since then overall turnover. The sluggishness of the recent years is obvious, following, again, the burst of the year 1981. Volume data for 1986 should display a recovery on the export side. On the import side, Soviet oil and grain purchases moved in opposite directions, which should result in overall stability.

Before investigating the geographical pattern of Soviet-South trade, one has to mention the methodological problem of the "residual" in this trade.

A. THE "RESIDUAL" IN SOVIET EXPORTS

USSR-Third World statistics display an "external residual", which is the difference between the total exports of the Soviet Union to the Third World, and the sum of the exports to individual

countries. In 1985 this difference amounted to 45 percent of total exports. The ratio has almost always remained slightly under 50 percent, and has sometimes been greater (in 1973, 1977, 1978, 1984, and in the first nine months of 1986).

Thus, in 1985, according to the *Foreign Trade Yearbook*, the USSR has been conducting trade with 54 developing countries, while it has declared to have commercial relations with 98 developing countries, not counting the DCs belonging to the socialist bloc (see M. Khaldine, in the French edition of the Soviet journal on foreign trade, *Commerce Extérieur* 1986, 6, p. 9). Among the 44 not mentioned, one has all the Oceania partners (Samoa, Papuasia, Fidji, Tonga), several Asian countries (Oman, UAE—the former has established official relations with the USSR just in 1985), and many African countries such as Benin, Gabon, Mauritania, Niger, Senegal, Seychelles Islands, Togo, Uganda, Zaire, Zambia, etc.

The residual is supposed to consist mainly of arms exports, although there is some controversy about the share and the nature of arms sales within that global figure (see Despres, in Lavigne et al., 1986). We shall revert to this point when discussing the commodity distribution of Soviet-South trade. Another problem less discussed concerns the list of the buyers. Obviously, those are not (or not mainly) the countries not identified by name. Should one divide the value of the residual (5137 million dollars in 1985) by the number of missing countries, one should reach an average value of over 110 million dollars, which is quite impossible and surpasses the turnover of trade with many a partner identified in the official Yearbook. One then has to infer that most of the non-identified export has to be attributed to the main recipients of Soviet arms deliveries. But to which partners exactly? in which proportions? This is not clear, especially taking into account that the deliveries to some countries may be paid for by others. In any case, the share of most of the Middle-East countries in Soviet exports must be higher than what may be computed from published data on "identified" trade.

B. THE REGIONAL STRUCTURE OF TRADE

Taking into account the underestimation of some export flows just discussed, one may first of all characterize the overall geographical pattern of trade as follows (see table 3):

A dominant and slightly increasing share of Asia (slightly over 50 percent in 1970, 58 percent in 1985, with a growing gap of the share of this area in Soviet exports to the Third World (67 percent in 1985—the highest share being reached in 1979 with almost 78 percent), and its share in Soviet imports (in average, 50 percent, the highest figures appearing in the end-seventies and reflecting increased (in value) oil imports from the Asian Middle East);

A decreasing share of Africa (over 40 percent in 1970, 25 percent in 1985);

With Latin America, a low share in Soviet exports, especially in the beginning and the end of the seventies, reaching its highest mark in 1975 and 1985 (7.5 percent); a much bigger and

fluctuating share in Soviet imports, due to the imports of grain mostly from Argentina, especially in selected years (1975-76, 1980-83).

TABLE 3.—GEOGRAPHICAL DISTRIBUTION OF SOVIET-LDC TRADE, 1970-85

[In percent of total trade with identified countries of the Third World]

Groupings	1970	1975	1980	1981	1982	1983	1984	1985
Asia								
Share in USSR X (percent)	52.1	62.8	73.8	74.6	70.5	66.2	66.7	66.9
Share in USSR M (percent)	50.5	45.4	49.5	44.9	45.8	46.6	52.1	50.9
Balance (millions of dollars)	26.2	-179.9	475.6	461.2	1,166.3	355.1	-408.3	-339.8
Africa								
Share in USSR X (percent)	46.6	29.5	23.5	23.3	24.2	29.7	27.1	25.3
Share in USSR M (percent)	43.1	29.0	20.6	15.5	26.7	24.5	26.2	25.1
Balance (millions of dollars)	43.2	-402.0	-217.3	-17.3	-600.3	-175.6	-629.3	-654.7
Latin America¹								
Share in USSR X (percent)	0.7	7.5	2.7	2.1	5.3	3.7	6.1	7.7
Share in USSR M (percent)	6.3	25.7	29.9	39.6	27.5	28.8	21.5	23.8
Balance (millions of dollars)	-70.1	-861.0	-2,139.8	-4,051.0	-2,115.0	-2,438.2	-1,567.1	-1,663.6
CSO 1								
Share in USSR X (percent)	3.7	14.1	13.6	14.1	14.1	17.9	22.4	21.6
Share in USSR M (percent)	2.8	4.7	6.1	4.6	4.7	4.3	4.5	4.9
Balance (millions of dollars)	11.3	25.5	316.9	495.2	638.6	875.9	1,857.7	-937.3
CSO 2								
Share in USSR X (percent)	16.1	26.4	20.6	26.6	25.6	15.3	16.0	19.2
Share in USSR M (percent)	7.4	18.5	11.1	5.9	6.3	10.9	14.8	14.5
Balance (millions of dollars)	107.9	-51.4	344.4	1,229.7	1,366.6	72.8	-307.2	-90.2
OPEC countries								
Share in USSR X (percent)	29.9	37.4	30.0	36.6	40.9	32.0	18.9	16.2
Share in USSR M (percent)	15.1	27.0	15.0	13.2	21.6	29.4	34.7	31.4
Balance (millions of dollars)	184.4	-104.8	584.5	1,163.9	1,126.0	-471.4	-1,945.5	-1,809.4
NICs								
Share in USSR X (percent)	0.9	5.7	2.1	2.0	4.5	3.0	2.8	2.8
Share in USSR M (percent)	4.7	20.4	29.8	39.1	26.5	28.2	22.8	22.6
Balance (millions of dollars)	-46.6	-688.5	-2,166.9	-4,011.0	-2,080.7	-2,432.7	1,910.0	-1,869.6
Sub-Saharan Africa								
Share in USSR X (percent)	4.5	6.6	9.0	9.7	11.1	14.5	13.8	13.5
Share in USSR M (percent)	7.3	7.6	6.9	3.9	3.1	3.7	4.6	4.7
Balance (millions of dollars)	-34.6	-135.7	-5.1	260.7	555.9	691.2	486.1	435.0
Arab and Islamic countries								
Share in USSR X (percent)	75.7	60.9	51.9	55.1	52.1	44.2	34.3	33.4
Share in USSR M (percent)	46.2	44.3	26.0	23.0	32.8	39.6	42.6	39.3
Balance (millions of dollars)	366.5	-189.5	1,009.0	1,413.5	941.7	-554.3	-1,645.5	-1,424.8

¹ Latin America comprises Central America.

Sources: as in table 1.

Methodological note: The shares of each grouping in Soviet exports (X) or imports (M) to the LDCs are computed on the identified trade by countries of the Third World. The residual is thus not taken into account (see text).

The countries included in specific groupings are the following: CSO 1: Afghanistan, South Yemen, Angola, Ethiopia, Mozambique. CSO 2: Algeria, Benin, Congo, Guinea, Madagascar, Tanzania, Nicaragua, Burma, Iraq, Syria. OPEC countries: Indonesia, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, United Arab Emirates, Algeria, Gabon, Libya, Nigeria, Ecuador, Venezuela. NICs: Argentina, Brazil, Mexico; Hong Kong, Singapore, South Korea, Taiwan. Sub-Saharan Africa: Angola, Benin, Botswana, Burkina Faso* (Haute-Volta), Burundi*, Cameroon, Central African Republic*, Chad*, Congo, Equatorial Guinea*, Ethiopia, Gabon*, Gambia*, Ghana, Guinea, Guinea Bissau*, Ivory Coast, Kenya*, Lesotho*, Liberia, Madagascar, Mali, Mauritius*, Mozambique, Niger*, Nigeria, Uganda*, Rwanda*, Senegal, Sierra Leone, Somalia, Tanzania, Togo, Zaire, Zambia*, Zimbabwe*. The countries marked with an * are cited in Soviet publications as having trade relations with the USSR, but not included in the Soviet Yearbook on foreign trade statistics. The data given in the table are thus minor, and some of the unidentified residual must be attributed to this group. Arab and Islamic countries: In Africa, Algeria, Egypt, Libya, Morocco, Mauritania, Sudan, Tunisia (sub-Saharan Islamic countries are not included); in Asia, Bahrain, Iran, Iraq, Jordan, Lebanon, Oman, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates, North Yemen, South Yemen.

Some specific groupings are considered below:

1. The group of the countries with a socialist orientation (CSO) is made up of two subgroups of unequal political significance and economic weight.

(i) The first one consists of the CSO having the status of observers within the CMEA, that is Angola (observer since 1976), Ethiopia (1978), Mozambique, South Yemen (1979) and Afghanistan (1980). This group should include, from 1986 on, Nicaragua, which attended as an observer the 40th session of the CMEA in June 1985. All of these countries belong to the group of "least developed developing countries". Their export potential is for the time being low, even if resources do exist, due to the low level of extraction and processing of raw materials, and to the present state of war and political instability. The USSR is more involved in trade with this group than any other CMEA country except for the GDR—East Germany has particularly developed trade with the African countries of this group. The share of the "CSO 1" in total identified Soviet exports has been steadily growing, from a percentage of 11 in 1979 up to 22 in 1985, and even 28 for the first 9 months of 1986 (36 when including Nicaragua). Increased deliveries of arms and equipment (in the framework of assistance as well as on commercial terms, mainly to Afghanistan, Nicaragua, Ethiopia and South Yemen) explain this expansion, while the share of the group in total Soviet imports has remained stable and low (under 5 percent). For this area strategic and aid considerations outstrip economic gains, especially taking into account that most of the Soviet surplus is not repaid and enters in the categories of clearing credit (Afghanistan), long-term cooperation credit or short term (with possibilities of rescheduling) commercial credit.

Afghanistan is the only country in this group for which trade with the USSR is significant (over 50 percent on the export side and over 60 percent on the import side). For Ethiopia, the USSR accounts for 30 percent of the country's imports and less than 5 percent of its exports. Angola makes less than 4 percent of its trade with the Soviet Union. For Mozambique and South Yemen, the shares of USSR in their total trade are very low (see Don, 1985, Tiraspol'sky, 1983 and 1987). Several co-operation agreements have been signed between the CMEA as such and CSO 1 countries, on the model of the 1985 Mozambique-CMEA agreement: with Angola, Ethiopia (October 1986), Afghanistan (January 1987). A similar arrangement is underway for South Yemen.

(ii) As for the second group of CSO which are not observers within the CMEA but have privileged links with the CMEA countries, the Soviet definition is less unequivocal. The most frequently quoted countries are, in Africa, Algeria, Benin, Congo, Guinea (up to the death of Sekou Toure in 1984), Madagascar, Tanzania; in Asia, Burma, Iraq, Syria; in America, Nicaragua (1979-85). Some other partners may probably be included, such as Guinea-Bissau, the Seychelles, Zimbabwe (see Ushakova, 1980; Dzarasov, ed., 1986). The USSR has consolidated its positions through several new long-term agreements with countries of this group in 1986: Algeria, Congo, Mali.

The share of this group in Soviet exports is rather close in 1970 and in 1985 (16-17 percent) but with large variations in-between due to trade with Iraq, which is, ahead of Algeria and Syria, one of

the most important partners of the Soviet Union in the Third World. The capacities of Iraq as exporter to the USSR largely influence the total share of the group in Soviet imports, fluctuating between lows of 6-7 percent and highs of 17-20 percent.

2. Trade with OPEC countries (which comprise Iraq and Algeria from the previous group) accounts for a much smaller share in the total USSR-LDC trade than in Eastern European-LDC trade. However this group probably absorbs the largest share of "unidentified" Soviet exports, and thus yields a positive trade balance for the USSR, contrary to the data on trade with individual countries.

Trade with this group of countries has been based in the eighties upon arms and equipment sales, matched by oil purchases for reexport, which surged (in quantities) from 1983 on (see table 7), that is since the beginning in the decline of oil prices. Is this strategy to last? The agreement reached in August 1986 between OPEC and the Soviet Union, for the backing of OPEC export cuts, and confirmed in January 1987 during the visit to Moscow of the Saudi Arabian oil minister, should at the same time improve the links with OPEC and limit the reexport of OPEC oil to Western countries. The USSR is in parallel seeking new forms of co-operation with these countries. New trade and cooperation agreements have been signed with Libya (October 1985), and Algeria (March 1986). In addition, the USSR has been extending new credit arrangements, and has concluded new compensation agreements "so as to avoid the accumulation of debts" (Osadchuk, 1987, p. 29). But with what are the OPEC countries to compensate if not with oil?

3. Trade with NICs—newly industrializing countries—is negligible on the export side, and much greater on the import side, with large variations following those of Soviet purchases from Argentina. The following countries belong to this group: Argentina, Brazil, Mexico, in Latin America; South Korea, Hong Kong, Singapore, Taiwan in Asia (of which only Singapore is mentioned in the Soviet statistics—there are probably some exchanges through traders with Hong Kong). The prospects for increased trade with the Asian NICs are probably doubtful. Should one include in this group the "potential" NICs such as Malaysia, Thailand, and Indonesia, prospects might be more promising, due to the interest displayed toward the Pacific and East Asian countries since the beginning of the Gorbachev era, and evidenced through high-level visits of Soviet officials to the three mentioned countries in 1985 and 1986. Though these countries are mainly suppliers of food and raw materials to the USSR, a development of manufactured imports cannot be precluded, should the Soviet Union wish to emphasize its openness as compared to trade restrictions on the US side.

4. Trade with Sub-Saharan Africa has a small share in Soviet-LDC trade. These relations offer a complex of rationale associated with the nature of the partners: the rationale of relations with a large oil-exporting country, endowed with a large economic potential (Nigeria); the rationale of trade with suppliers of raw materials (Guinea) and tropical food products (Cameroon, Ivory Coast, Ghana); finally, the specifics of trade with both types of CSOs. The Soviet Union seems to be willing to upgrade its trade with this area. In December 1985, a cooperation agreement was signed with Zimbabwe; an extension of trade and co-operation is also expected

with Tanzania, Kenya, Sudan, Cameroon, Gabon, Senegal (Kuznetsov, 1986, p. 24).

5. Finally the last grouping includes the Arab and Islamic countries of North Africa and the Middle East. This group has in common a political and ideological feature, the Islamic faith, and, for the Asian Middle East, a close distance to the Soviet Union. Though the share of this group has declined from the beginning of the seventies, from over 50 percent to around 40 percent of Soviet-LDC trade, it represents a cluster of all the interests of the Soviet Union in the Third World. Such are:

Availability of oil (Algeria, Libya, Middle East);

Availability of raw materials (rock phosphate in Morocco, Tunisia; cotton in Egypt, Syria), food (citruses in Egypt and Morocco, olive oil in Tunisia, dried fruit in Turkey), as well as of manufactured goods (Egypt, Syria, Turkey);

A socialist orientation, "confirmed" (South Yemen) or "declared" (Algeria, Syria, and Iraq, but definitely not Libya: socialist orientation and Muslim integrism are not compatible);

A large GNP (over 100 billion dollars for Saudi Arabia, over 50 for Iran, Turkey; between 25 and 50 for Algeria, Egypt, Iraq, Kuwait, Libya, United Arab Emirates) and thus a large economic potential.

C. THE MAIN PARTNERS

We have now to identify the major partners of the USSR in the Third World (table 4).

TABLE 4.—RANKING OF INDIVIDUAL COUNTRIES IN SOVIET TRADE WITH THE THIRD WORLD, 1980 TO 1985

Countries	1980		1981		1982		1983		1984		1985	
	X	M	X	M	X	M	X	M	X	M	X	M
Major partners:												
India.....	1 (22.8)	2 (17.5)	1 (21.0)	2 (17.4)	1 (18.9)	1 (21.9)	1 (23.9)	2 (15.0)	1 (28.7)	1 (16.9)	1 (29.6)	1 (19.8)
Iraq.....	2 (12.6)	4 (5.1)	2 (17.9)	.....	2 (17.7)	.....	4 (7.0)	5 (5.5)	4 (5.1)	4 (8.9)	6 (5.0)	4 (7.3)
Iran.....	4 (6.9)	.....	3 (8.1)	4 (6.1)	3 (10.5)	9 (2.8)	2 (10.5)	6 (5.4)	6 (4.5)	9 (3.2)	8 (3.8)	.....
Libya.....	8 (4.3)	3 (5.7)	8 (3.7)	5 (4.7)	6 (4.0)	3 (16.7)	6 (5.0)	3 (14.5)	.....	2 (15.1)	.....	.....
Argentina.....	.....	1 (23.0)	.....	1 (31.0)	.....	2 (18.8)	.....	1 (18.6)	.....	3 (14.7)	.....	3 (11.6)
Egypt.....	6 (4.6)	7 (4.2)	7 (4.8)	8 (3.5)	7 (3.9)	5 (4.5)	7 (4.8)	7 (5.1)	3 (5.2)	8 (3.6)	.....	2 (16.2)
Syria.....	7 (4.4)	10 (3.1)	6 (5.5)	9 (3.3)	8 (3.8)	6 (4.5)	8 (3.8)	8 (4.3)	5 (4.7)	10 (2.9)	4 (5.3)	8 (4.0)
Turkey.....	3 (8.7)	.....	5 (6.3)	.....	.....	.....	.....	.....	.....	.....	3 (6.0)	10 (3.5)
Afghanistan.....	.....	.....	4 (6.7)	6 (4.1)	4 (7.5)	7 (4.1)	3 (7.5)	9 (3.9)	2 (11.1)	6 (4.0)	2 (10.3)	7 (4.3)
Nigeria.....	5 (6.6)	5 (5.1)	9 (3.1)	.....	5 (4.8)	.....	5 (5.8)	.....	2 (3.2)	.....	10 (2.8)	.....
Other important partners:												
Algeria.....	.....	.....	.....	.....	.....	.....	.....	.....	10 (2.6)	.....	.....	9 (3.6)
Angola.....	.....	.....	.....	.....	.....	.....	9 (3.2)	.....	9 (2.7)	.....	.....	.....
Brazil.....	.....	6 (5.0)	.....	3 (7.0)	10 (3.2)	4 (6.2)	.....	4 (8.5)	.....	5 (5.0)	.....	5 (5.0)
Ethiopia.....	10 (3.2)	.....	10 (2.7)	.....	9 (3.3)	.....	10 (3.2)	.....	7 (3.8)	.....	5 (5.3)	.....
Malaysia.....	.....	8 (3.8)	.....	10 (2.3)	.....	8 (3.5)	.....	10 (3.5)	.....	.....	.....	.....
Nicaragua.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7 (4.0)	.....
Pakistan.....	9 (3.3)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Saudi Arabia.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7 (3.9)	.....	6 (5.0)
Thailand.....	.....	9 (3.3)	.....	7 (4.0)	.....	10 (2.0)	.....	.....	.....	.....	.....	.....

Sources: as in table 1.

X = exports of the USSR; M = imports of the USSR. In each column, the numbers (from 1 to 10) express the rank of the Third World country in the Soviet exports or imports. The shares are given between brackets; they are calculated on total exports to or imports from the identified partners of the USSR in the Third World.

There is a very heavy concentration (though slightly declining since the seventies along with a certain diversification) in Soviet trade with the Third World. For the first part of the eighties the 10 major partners represent in average 75 percent of identified exports and 80 percent of Soviet imports; the 5 major partners, 55 percent (on exports) and 60 percent (on imports).

1. India has consistently been the most important partner in the eighties, as was Egypt in the early seventies. Trade flows underwent deep changes in their commodity composition since 1979, when oil exports of the USSR first exceeded $\frac{3}{4}$ of total identified exports. While previously, the USSR had been a supplier of equipment and technology, the pattern of its trade evolved toward a North-South pattern . . . with the USSR in the role of the "South". The sales of oil declined in value since 1983, along with an increased share of machinery. The Indian-Soviet cooperation agreements of May 1985 provided India with 1 billion rubles (1.2 billion dollars) in credits for industrial projects. The new credit line agreed upon in November 1986 (1.5 billion roubles) is designed for expanding Soviet-built industrial plants (steel mills at Bhilai and Bokaro) and constructing new plants for alumina processing, hydro-power stations, and oil exploration capacities. This will not only improve the commodity composition of trade, but will also help to maintain a balance in trade in a context of falling prices for oil. Trade between the two countries is settled according to a clearing agreement. In the seventies India was regularly in surplus, even taking into account her repayments for cooperation credits extended in the sixties. As settlements are made in clearing, this was unfavorable to India, even after the compromise on the rate of exchange of the rupee against the ruble reached in 1978. Despite the increase in oil prices following the second oil shock in 1979, India still had large surpluses in 1981-82, followed by three years of deficits which nevertheless left a positive balance of slightly less than 300 million dollars. In 1986, the value of Soviet exports collapsed by roughly one half; the agreement reached at the end of that year should allow for increased sales of goods other than oil and oil products. In exchange, India supplies the USSR with food (tea, coffee, rice) and raw agricultural materials, but also with manufactured consumption goods, mainly clothing and textiles ($\frac{1}{4}$ of Indian sales in 1981-85) and with machinery (5 percent in 1980, 14 percent in 1985).

India is the sole significant supplier of equipment and advanced technology (computers, following such goods as Rank Xerox copiers), often manufactured in India by subsidiaries of Western multinationals.

2. Iraq, Iran, Libya are the main partners of the USSR among the Middle East oil exporting countries. Libya is probably the first partner in the area notwithstanding the low and declining amount of recorded Soviet exports; the level of Soviet oil purchases, strongly lifted since 1982 in volume (with a drop in 1985 only, followed by an increase in 1986) is offset by military sales. Iraq has also been a major recipient of arms sales especially in the beginning of the Iraq/Iran war (1981/82). The Soviet-Iraqi trade and co-operation agreement signed in May 1986 may upgrade Soviet non-military equipment sales, which strongly declined in 1983-85. Recent devel-

opments are bound to boost Iran-Soviet trade, which had already begun to recover in 1981 from the lows reached after the Islamic revolution of 1979. In August 1986, both countries decided upon a revival of gas sales, which had almost totally stopped in 1980. From 1987 to 1990, these sales are expected to increase from 1 billion cm per year up to an average of 28 billion cm, which amounts to three times the quantity sold in 1979 and also to three times the transit capacity of the IGAT-1 gas pipeline. This would suggest prospects of co-operation between the two countries for expanding these capacities.

3. Argentina has been the main import partner of the USSR in 1980 and 1981, when it replaced the United States and Western Europe as the main supplier of grain during the grain embargo. It receded to the second place in 1982, jumped again to the first in 1983. In 1984 and 1985 it was surpassed by India. However, the Soviet imports remained high, largely over the mark of 4.5 million tons of grain annually set in the agreement which had been signed between both countries in 1980 (from 17.5 million tons in 1981, to 7 million in 1984 and 9 in 1985). But in 1986, notwithstanding the renewal of the grain agreement for another 5 years, trade fell to an historical six-year low. The Soviet Union had accumulated a trade deficit of over 11 billion dollars in trade with Argentina for the period 1980-85, and the good harvest of 1986 allowed for a drastic reduction in grain imports. The renewal of bilateral trade is thus linked with the willingness of Argentina to buy Soviet equipment, in principle agreed to in October 1986.

4. Egypt, Syria, and Turkey are regular partners of the Soviet Union. Once the main Soviet partner in the Third World, Egypt has loosened its links with the USSR in the mid-seventies. The 1971 treaty of friendship and co-operation was abrogated in 1976, and debt repayments were suspended in 1977. However, exchanges went on, under a clearing agreement of 1974 which was not abolished though, unlike the Soviet-Indian agreement, it is favorable to Egypt because of the surestimation of the Egyptian pound. At the end of 1986 a new trade protocol was signed, which should boost mutual trade, providing for increased Egyptian exports of manufactures (perfumery, textiles) as well as cotton and foodstuffs, in exchange for equipment, lumber, and coal.

Soviet-Turkish trade is also to expand from 1987 on with the beginning of gas sales from the USSR (less than a billion cm in 1987, up to 6 billion in 1990). This might lead to a further diversification of Soviet-Turkish trade. At present Turkish exports to the USSR include cotton, citrus fruit, nuts, vegetable oil, and a small share of industrial products which might increase rapidly, along with export of services such as the building of hotels on the Black Sea coast in the Soviet Union.

Syria may then well recede in ranking in the future. It is now the Middle East country with the highest share of manufactures in total sales to the USSR (almost $\frac{2}{3}$ in 1985, mostly textiles, drugs, and perfumery).

5. Afghanistan ranks high in Soviet exports mainly due to machinery and military equipment sales, along with Ethiopia and Syria, for similar reasons.

6. Nigeria is the only important partner in sub-Saharan Africa, as an outlet for Soviet machinery exports, which largely outstrip cocoa imports. Malaysia sometimes appears on the import side closing the list of the 10 major partners, as a supplier of rubber, palm oil, and tin.

This review of Soviet partners shows the variety of Soviet economic interests, which may be joined with strategic interests but increasingly assert themselves. The adjustment to the new situation created by the fall in oil prices in 1986 is typical. As a buyer or as a seller (or re-seller) the Soviet Union seeks arrangements which allow the maintenance of the level of trade and minimize the loss in hard currency. A more systematic review of the commodity composition of trade clarifies the exact nature of these interests.

III. COMMODITY COMPOSITION OF TRADE

The Soviet Union does not exactly follow a "North-South" pattern in its trade with the LDCs. Again, the evaluation is hampered by the problem of the "residual". To the "external" residual already mentioned, one has to add the "internal" one. For many Soviet partners, the share of "unidentified" Soviet exports to a given country may be quite important, up to 75 percent (this was the case for Soviet exports to Iraq in 1981). Again, the usual approach is to treat all the residual as arms sales.

A. THE SOVIET EXPORTS

Table 5 gives the commodity composition of Soviet exports.

TABLE 5A.—TRADE OF THE USSR WITH THE DEVELOPING COUNTRIES, TOTAL, COMMODITY COMPOSITION
 (In percent of total trade)

	1970	1972	1973	1974	1975	1976	1977
Exports:							
0+1.....	4.1	7.4	2.1	3.9	5.8	13.7	12.4
2+4.....	3.8	6.8	4.9	9.1	3.4	8.1	6.1
3.....	3.5	6.3	3.8	7.1	2.3	5.4	10.5
5.....	1.1	1.9	1.2	2.3	1.1	2.7	3.1
6+8.....	10.1	18.3	8.5	15.8	5.2	12.3	7.6
7.....	32.8	59.2	33.2	61.7	94.4	57.8	20.0
0-4.....	11.4	20.5	10.8	20.1	11.5	27.2	29.0
5-8.....	44.0	79.4	42.9	79.8	30.7	72.8	30.7
Residual.....	44.6	.....	46.3	.....	57.8	40.3	40.3
						46.6	55.7
							63.5
Imports:							
0+1.....	1.1	3.1	2.2	5.3	2.1	4.6	1.4
2+4.....	2.0	5.7	1.7	4.1	2.5	5.6	4.4
3.....	6.8	19.4	13.4	31.8	15.5	34.5	16.5
5.....	1.3	3.9	1.0	2.3	1.8	4.0	3.0
6+8.....	3.1	9.0	2.5	5.9	2.5	5.5	2.0
7.....	20.6	59.0	21.2	50.6	20.6	45.9	18.3
0-4.....	9.9	28.2	17.3	41.2	20.1	44.7	22.3
5-8.....	25.0	71.9	24.7	58.8	24.9	55.4	23.3
Residual.....	65.1	.....	58.0	.....	55.0	54.4	54.4
						59.4	45.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
							52.7
							30.1
							46.8
							34.2
							53.2
							35.7
							51
							3.3
							4.2
							38.6
							15.7
							17.9
							2.4
							4.1
							7.5
							11.4
							19.4
							35.4
							20.1
							31.3
							28.9
			</				

TABLE 5A.—TRADE OF THE USSR WITH THE DEVELOPING COUNTRIES, TOTAL, COMMODITY COMPOSITION—Continued

	1970	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
7	.2	.6	.5	.5	.8	.7	.6	.8	.6	.7	.8	1.2	1.1	3.5
0-4	74.6	72.6	77.7	80.2	79.4	82.6	79.7	79.2	80.6	80.6	84.1	78.2	78.6	73.1
5-8	25.0	21.2	22.3	19.7	20.7	17.3	20.2	20.6	18.6	18.6	15.3	20.8	20.1	25.3
Residual	.4	.2	0	.1	0	.1	.1	.2	.8	.8	.6	1.0	1.4	1.6

Percentages of total trade are computed:

For exports, in left column for each year, on the sum of SITC 0 to 9; in right column, on the sum of SITC 0 to 8 (residual excluded);

For imports, on the sum of SITC 0 to 9.

SITC classes: 0. Food and live animals. 1. Beverages and tobacco. 2. Crude materials, inedible, excluding fuels. 3. Mineral fuels, lubricants. 4. Animal/vegetable oil and fats. 5. Chemicals. 6. Manufactured goods by

chief material. 7. Machinery and transport equipment. 8. Miscellaneous manufactured goods. 9. Items not classified.

... "Monthly Bulletin of Statistics," August 1976, May 1979, May 1982, May 1984, May 1986.

TABLE 5B.—TRADE OF THE USSR WITH OPEC COUNTRIES, COMMODITY COMPOSITION

[In percent of total trade]

	0+1	2+4	3	5	6+8	7	0-4	5-8	Residual
Exports:									
1970.....	7.8	7.0		0.5	13.7	63.2	14.8	77.4	7.8
1972.....	2.4	8.8	0.6	.6	12.4	61.9	11.8	74.9	13.3
1973.....	.2	8.5	.8	.8	13.5	56.9	9.5	71.2	19.3
1974.....	.1	16.7	.6	2.9	14.7	49.2	17.4	66.8	15.8
1975.....	.1	9.5	1.1	2.9	9.1	55.8	10.7	67.8	21.5
1976.....	.7	6.4	.7	.7	6.2	60.9	7.8	67.8	24.4
1977.....	.1	6.3	1.0	1.2	6.5	47.2	7.4	54.9	37.7
1978.....	.1	2.6	.1	.4	6.4	40.4	2.8	47.4	49.8
1979.....	.1	1.8	.2	.6	4.0	42.6	2.1	47.2	50.7
1980.....	0	4.9	.3	1.3	5.6	49.1	5.2	56.0	38.8
1981.....	.4	6.2	.2	2.5	3.1	36.8	6.8	42.4	50.8
1982.....	.4	4.4	.1	2.4	1.8	40.6	4.9	44.8	50.3
1983.....	1.5	3.1	.1	2.1	1.4	54.2	4.6	55.7	37.7
1984.....	.5	.7	.2	2.1	3.3	72.2	1.4	77.6	21.1
Imports:									
1970.....	55.0	26.0	3.6	4.1	11.2	0	84.6	15.3	.1
1972.....	30.5	7.3	49.1	2.9	9.9		86.9	12.8	.3
1973.....	23.7	6.9	63.7	.4	5.2		94.3	5.6	.1
1974.....	25.8	11.0	60.1	.8	2.2		96.9	3.0	.1
1975.....	26.0	6.0	65.9	.4	1.8		97.8	2.2	0
1976.....	15.3	8.0	74.0	1.3	1.5		97.3	2.8	0
1977.....	11.3	10.4	74.6	1.3	2.4		96.3	3.7	0
1978.....	10.0	11.5	74.9		2.4		9.4	2.4	1.2
1979.....	6.2	7.6	84.1		2.1		97.9	2.1	0
1980.....	11.2	11.2	74.3		3.2		96.8	3.2	0
1981.....	23.4	28.4	37.9		9.7		89.7	9.7	.6
1982.....	26.6	22.6	41.3		8.9		90.5	8.9	.6
1983.....	19.4	18.2	59.3		1.0		96.9	1.0	2.1
1984.....	21.3	21.3	53.5		1.8		96.1	1.8	2.1

Sources: The same as for table 5A.

Percentages are computed on the sum of SITC 0 to 9.

TABLE 5C.—TRADE OF THE USSR WITH THE DEVELOPING COUNTRIES OF ASIA (MIDDLE EAST EXCLUDED), COMMODITY COMPOSITION

[In percent of total trade]

	0+1	2+4	3	5	6+8	7	0-4	5-8	Residual
Exports:									
1970.....	4.2	2.1	4.6	3.0	23.2	55.7	10.9	81.9	7.2
1972.....	1.9	6.0	6.0	3.4	18.4	53.9	13.9	75.9	10.4
1973.....	32.0	5.3	5.1	2.9	12.8	35.8	42.4	51.5	6.1
1974.....	45.7	3.6	14.3	7.8	9.5	16.3	63.6	33.6	2.8
1975.....	21.6	4.0	22.2	10.8	7.4	24.6	47.8	42.8	9.4
1976.....	2.6	8.0	26.0	4.3	8.5	39.1	36.6	51.9	11.5
1977.....	2.1	6.6	33.9	4.3	6.4	38.4	42.6	49.1	8.3
1978.....	3.4	5.1	39.2	6.1	5.8	32.0	47.7	43.9	8.4
1979.....	10.0	3.3	48.2	2.4	4.2	31.9	61.5	38.5	0
1980.....	7.4	3.2	53.9	3.7	3.3	27.2	64.5	34.2	1.3
1981.....	4.2	5.5	54.1	7.2	2.9	22.8	63.8	32.9	3.3
1982.....	4.9	2.3	56.6	5.7	2.9	24.4	63.9	33.0	3.1
1983.....	2.0	1.2	56.1	2.6	2.7	23.8	59.3	27.1	11.6
1984.....	1.5	1.3	50.4	3.9	2.3	29.1	53.2	35.3	11.5
Imports:									
1970.....	23.3	38.4	3.6	1.4	33.0	.2	65.3	34.7	0
1972.....	30.2	25.3	4.1	1.7	37.4	.9	59.6	40.0	.4
1973.....	23.1	36.2	3.9	1.2	34.6	.9	63.2	36.7	.1
1974.....	24.9	40.8	5.1	2.0	25.9	1.1	70.8	29.0	.2

TABLE 5C.—TRADE OF THE USSR WITH THE DEVELOPING COUNTRIES OF ASIA (MIDDLE EAST EXCLUDED), COMMODITY COMPOSITION—Continued

	[In percent of total trade]								
	0+1	2+4	3	5	6+8	7	0-4	5-8	Residual
1975.....	29.8	27.2	6.9	3.5	30.3	2.3	63.9	36.1	0
1976.....	28.6	31.7	5.7	3.3	25.9	2.6	66.0	31.8	2.2
1977.....	32.8	31.1	5.7	3.1	25.5	2.0	69.5	30.5	.....
1978.....	26.6	34.0	6.7	1.8	28.0	2.6	67.3	32.4	.3
1979.....	21.8	34.7	5.3	3.0	31.5	1.6	61.8	36.1	2.1
1980.....	31.2	23.9	8.5	5.0	27.8	1.8	63.6	34.6	1.8
1981.....	34.2	25.8	7.2	1.6	27.1	2.3	67.2	31.1	1.7
1982.....	28.0	25.1	7.9	2.1	28.9	2.7	61.0	33.7	5.3
1983.....	22.8	26.9	12.6	1.9	30.0	2.6	62.2	34.6	3.1
1984.....	22.1	26.4	11.6	1.8	28.6	6.9	60.0	37.3	2.7

Sources: The same as for table 5A.

Percentages are computed on the sum of SITC 0 to 9.

TABLE 5D.—TRADE OF THE USSR WITH THE DEVELOPING COUNTRIES OF LATIN AMERICA (LATIN AMERICAN INTEGRATION ASSOCIATION), COMMODITY COMPOSITION

	[In percent of total trade]								
	0+1	2+4	3	5	6+8	7	0-4	5-8	Residual
Exports:									
1970.....				11.1	33.3	44.4		88.9	11.1
1972.....	6.3			6.3	6.3	56.3	6.3	68.9	24.8
1973.....	19.6	8.9		8.9	12.5	50.0	28.5	71.4	.1
1974.....	.7		74.8	3.5	5.6	14.7	75.5	23.8	.7
1975.....	.5	2.0	61.8	2.0	2.5	30.2	64.3	34.7	1.0
1976.....	.7	2.0	63.3	2.7	1.3	25.3	66.0	29.3	4.7
1977.....	.5	1.9	61.6	4.7	.5	28.4	64.0	33.6	2.4
1978.....	.8	1.5	21.4	7.6	1.5	62.6	23.7	71.7	4.6
1979.....		2.0		10.2	1.0	81.6	2.0	92.8	5.2
1980.....		6.9		20.0	1.5	66.9	6.9	88.5	4.6
1981.....	.9			22.9	1.8	68.6	.9	92.7	6.4
1982.....	.3		69.7	5.4	.3	21.3	70.0	27.0	3.0
1983.....	.5	0	67.0	4.1	.5	23.9	67.5	28.4	4.1
1984.....	7.9	0	61.1	4.6	.9	19.4	69.0	25.0	6.0
Imports:									
1970.....	46.3	44.8			7.5		91.1	7.5	1.4
1972.....	60.0	16.3			23.0		76.3	23.0	.7
1973.....	59.1	28.2		.3	11.7	.7	87.3	12.7	0
1974.....	73.0	20.0		.2	6.7		93.0	6.9	.1
1975.....	75.9	18.3		.2	5.6	.5	94.0	6.0	0
1976.....	50.0	42.8	.4	.1	6.7		93.2	6.8	0
1977.....	39.8	43.3	2.0	.5	14.2	.2	85.1	14.9	0
1978.....	62.0	23.7		.4	13.9	0	85.7	14.3	0
1979.....	61.5	22.0	1.9	.8	13.6	1	85.4	14.6	0
1980.....	74.8	20.4	.6	.5	3.6	0	95.8	4.1	.1
1981.....	79.1	17.7	.6	.5	2.2	0	97.4	2.7	0
1982.....	74.1	21.7	.2	.6	3.4		96.0	4.0	0
1983.....	80.3	16.4	.2	.5	2.7		96.9	3.1	0
1984.....	74.6	20.6	.1	.2	4.4		95.3	4.6	.1

Sources: The same as for table 5A.

Percentages are computed on the sum of SITC 0 to 9.

TABLE 5E.—TRADE OF THE USSR WITH THE DEVELOPING COUNTRIES OF AFRICA, COMMODITY COMPOSITION

[In percent of total trade]

	0 + 1	2 + 4	3	5	6 + 8	7	0-4	5-8	Residual
Exports:									
1970.....	9.1	8.6	9.3	1.6	12.6	43.1	27.0	57.3	15.7
1972.....	2.8	8.4	13.2	1.4	11.6	48.8	24.4	60.4	15.2
1973.....	3.6	10.3	9.5	.8	11.9	50.2	23.4	62.9	13.7
1974.....	8.8	16.2	24.0	.8	16.9	29.7	49.0	47.4	3.6
1975.....	7.5	12.5	20.6	.9	14.3	30.1	40.6	45.3	14.1
1976.....	6.0	11.1	22.2	1.6	8.9	37.2	39.3	47.7	13.0
1977.....	4.2	10.3	20.0	1.7	8.0	43.2	34.5	52.9	12.6
1978.....	5.3	5.9	12.3	1.6	12.6	49.4	23.5	63.6	12.9
1979.....	5.5	5.3	16.4	1.1	6.5	50.2	25.2	57.8	17.0
1980.....	3.4	8.6	11.7	2.8	3.0	51.5	23.7	57.3	19.0
1981.....	2.9	13.1	21.9	3.6	3.2	50.2	37.9	57.0	5.1
1982.....	2.3	3.9	23.4	1.8	5.3	56.5	29.6	63.6	6.8
1983.....	3.0	4.3	18.9	.5	2.2	61.2	26.2	63.9	9.9
1984.....	3.3	5.5	21.1	2.1	1.9	58.6	29.9	60.7	9.5
Imports:									
1970.....	40.9	38.6	2.1	1.4	16.8	.....	81.6	18.2	.2
1972.....	41.3	24.8	11.9	1.9	19.4	.9	78.0	22.0	0
1973.....	41.5	25.7	11.3	2.4	18.5	.5	78.5	21.4	.1
1974.....	42.2	31.4	1.6	2.3	22.0	.4	75.2	24.7	.1
1975.....	44.5	23.3	1.4	5.1	25.4	.4	69.2	30.9	0
1976.....	55.3	19.6	1.6	4.3	18.7	.....	76.5	23.0	.5
1977.....	43.4	25.7	.1	5.5	25.4	.....	69.0	31.0	0
1978.....	58.5	8.4	.....	5.0	28.1	.....	66.9	33.1	0
1979.....	69.1	12.9	.3	2.6	14.8	.....	82.3	17.7	0
1980.....	73.8	10.5	.....	3.7	11.4	.....	84.3	15.1	.6
1981.....	65.0	15.1	0	4.6	14.7	.....	80.1	19.3	.6
1982.....	54.0	17.4	0	6.1	21.8	.....	71.4	27.9	.7
1983.....	66.3	14.2	0	4.6	13.2	.....	80.6	17.8	1.5
1984.....	58.0	19.4	0	7.0	13.6	.....	77.5	20.7	1.9

Sources: The same as for table 5A.

Percentages are computed on the sum of SITC 0 to 9.

Once the residual is deducted, machinery accounts for 40-50 percent of total sales. Its share is highest in Africa, followed by OPEC countries (the latter have in addition the highest "internal" export residual). Thus, the share of machinery is related to the level of development of the partner countries; the more developed clients of the USSR are reluctant to import equipment goods, which was evidenced by the 1986 negotiations of the USSR with India and Argentina.

Machinery sales to the Third World accounted in 1985 for slightly over 20 percent of total equipment sales, which was almost the same share as for the Communist Third World countries, that is Cuba, Vietnam, Mongolia, North Korea, Laos, Kampuchea. A large part of it is exported under co-operation agreements, between 50 and 40 percent. For some countries this share is above average, namely for Nigeria (where almost all machinery exports are covered by co-operation agreements in 1981-85), Algeria, South Yemen, Iran, Pakistan, Turkey. Such exports are made on concessionary terms and repaid in traditional export goods of the recipient. However this should be considered as a very crude measure of the Soviet assistance linked with trade. For instance Libya, which is mentioned among the countries receiving machinery through co-

operation agreements, is not usually considered in Western investigations to be a recipient of Soviet aid.

The format of machinery exports is undergoing changes similar to those of Western exports to the Soviet Union, for similar reasons. The reduction in the import potential of many Soviet clients, especially oil exporters, leads to a decrease of turnkey plants sales, and to a parallel increase in machinery exports designed for modernization, revamping of objects built with Soviet participation, often with a larger recourse to the technology of the partner (Osadchuk, 1987, p. 24).

The second item in Soviet exports, again excluding the "residual", is fuels (mainly oil). Its share began to grow since 1974 and was over $\frac{1}{3}$ of Soviet identified exports in 1980-83, falling under 30 percent after 1984. Fuels represent over 50 percent of sales to Asia (outside Middle East), 60 to 70 percent of sales to Latin America.

The reorientation of Soviet exports following the drop in oil prices in 1986, which has been largely commented on in its implications for Soviet-Western trade, should also affect trade with the Third World. We have mentioned the adjustments realized in India-Soviet trade, and sought for in the relations with Argentina. The Soviet Union appears very eager to substitute manufactured goods sales for oil supplies. The LDCs are better markets for Soviet equipment than the developed world, especially if such sales are included in clearing agreements (the case of India) or offered against compensation in kind to countries retaining a structural surplus on the USSR and engaged in a rescheduling process which favors the recourse to barter (barter being a means to avoid earmarking exports gains for reimbursing the debt). The second case is that of Latin American countries.

The new regulations introduced in the field of foreign trade in 1986 and 1987 may be applied here. However, one may be skeptical as to the ability of Soviet machine-building enterprises to sell directly in the Third World without the help of the foreign trade organizations. The new rules on joint ventures provided for in the decree of January 13, 1987 (which explicitly mentions the joint ventures with partners from developing countries) may also be extended. The only cases mentioned end-1986 are prospects for India-Soviet joint ventures, in the field of footwear, motor components, road-building equipment, and construction services (India would build three hotels in the USSR) (*Financial Times*, 28 November 1986).

B. THE SOVIET IMPORTS

Like Soviet exports, Soviet imports from the Third World do not follow the usual North-South pattern. True, the share of primary goods is dominant, but the share of manufactures is steadily increasing. Within the group of primary goods, food and non-fuel raw materials account for most of the import trade, while oil imports have a much smaller share in total purchases than is the case in North-South or even East European-South trade.

1. The priority to food imports

The share of food and agricultural products has always been high in Soviet imports from the Third World, but it suddenly increased in 1980 (see table 5) due to the succession of bad harvests in the USSR since 1979 and to the grain embargo of 1980-81 monitored by the United States.

The good harvest of 1986 may bring about the beginning of a change. Grain trade with Argentina declined dramatically. During the first nine months of 1986, the USSR bought less than 1 million tons of grain, considerably lagging behind the implementation of the grain trade agreement renewed in the beginning of 1986. Overall, food imports amounted in average to one half of Soviet imports from the Third World in the period 1980-85, but with a share declining since 1984 to about two-fifths. Within the food imports, the share of grain was again on average about one half over the same period. Should the recovery in grain output last in the Soviet Union, there might be a large drop in total imports from the Third World. The decrease in grain purchases already accounted for about three quarters of the 22 percent drop in the import trade with the LDCs for the first nine months of 1986.

Africa, together with Latin America, is a major source of food supplies other than grain (table 6). Over the years 1980-85, two facts are striking: along with a general rising trend in food imports mentioned, there are very strong fluctuations in imports from individual countries (see table 6). This confirms the findings of Thomas Wolf according to which the Soviet Union is a rather unstable partner as compared to Western importers of primary products (Wolf, 1985), and this instability seems to be increasing over time, at least for food commodities. However, unlike the East European countries, the USSR is buying its tropical food products mainly from the producers, and not through traders (see the shares table 6).

TABLE 6.—SOVIET IMPORTS OF COFFEE, COCOA AND TEA FROM THIRD WORLD SUPPLIERS, 1980-85

Commodities	1980	1981	1982	1983	1984	1985
Coffee (t)						
Total imports.....	48,253.0	41,000.0	47,857.0	37,160.0	48,178.0	56,729.0
From:						
India.....	23,600.0	23,950.0	31,000.0	27,000.0	20,650.0	35,850.0
Ethiopia.....	10,000.0				5,000.0	5,000.0
Brazil.....	3,507.0	4,002.0	7,000.0		6,505.0	
Colombia.....	1,999.0		2,000.0	2,000.0	3,995.0	
Mexico.....	500.0	500.0	1,000.0		2,500.0	
Nicaragua.....	1,000.0	3,000.0	3,000.0	3,000.0		
Peru.....	500.0	500.0			1,300.0	3,592.0
Indonesia.....					2,522.0	3,000.0
Angola.....	5,111.0	2,970.0				
Madagascar.....	1,002.0	4,054.0				510.0
Total from identified suppliers.....	47,219.0	38,976.0	44,000.0	32,000.0	42,472.0	47,952.0
Share in overall imports (percent).....	97.9	95.1	91.9	86.1	88.2	84.5
Cocoa (t)						
Total imports.....	128,844.0	121,139.0	115,459.0	162,279.0	149,984.0	154,858.0
From:						
Ivory Coast.....	28,645.0	60,170.0	44,504.0	28,062.0	60,345.0	55,059.0

TABLE 6.—SOVIET IMPORTS OF COFFEE, COCOA AND TEA FROM THIRD WORLD SUPPLIERS, 1980-85—Continued

Commodities	1980	1981	1982	1983	1984	1985
Ghana.....	59,994.0	27,150.0	26,240.0	31,667.0	22,375.0	18,100.0
Nigeria.....	10,000.0	11,811.0	10,154.0	49,879.0	19,800.0	19,250.0
Brazil.....	22,681.0	12,884.0	25,540.0	42,809.0	30,324.0	43,281.0
Cameroon.....		5,031.0	4,019.0	6,712.0	5,221.0	9,090.0
Sierra Leone.....	1,524.0	2,590.0			788.0	4,998.0
Malaysia.....					4,367.0	2,302.0
Total from identified suppliers.....	122,844.0	119,636.0	110,457.0	159,129.0	143,220.0	152,080.0
Share in overall imports (percent)	95.3	98.8	95.7	98.1	95.5	98.2
Tea (t)						
Total imports.....	70,878.0	84,521.0	73,391.0	76,741.0	94,579.0	108,076.0
From:						
India.....	59,746.0	77,000.0	61,421.0	61,932.0	75,575.0	83,353.0
Sri Lanka.....	3,700.0	2,003.0	2,999.0	3,784.0	10,082.0	7,444.0
Bangladesh.....	510.0	725.0	2,392.0	1,853.0	1,033.0	2,296.0
Total from identified suppliers.....	63,956.0	79,728.0	66,812.0	67,569.0	86,690.0	93,093.0
Share in overall imports (percent)	90.2	94.3	91.0	88.0	91.7	86.1

Source: Vneshniia Torgovlia SSSR — —, yearbook.

2. Raw materials: The road of co-operation

The Soviet Union is a major producer and exporter of most of the minerals extracted in the world. Thus its behavior in this field is two-fold. For a range of commodities (especially non ferrous metals) the Soviet Union acts erratically, making strategic purchases the amount of which is widely fluctuating from one year to the other, and cannot be traced through Soviet statistics as such data have disappeared from the foreign trade yearbooks since the mid-seventies. The difficulty is increased by the fact that many of these purchases are made on the open market. For a fewer number of minerals, the Soviet Union has developed a long-time supply policy. This applies mainly to bauxite and phosphate rock, but also, increasingly, to some strategic metals.

The USSR depends on imports for about 45-50 percent of its needs for bauxite. Its first move in this field has been an agreement concluded with Guinea in 1969. According to this agreement, the Soviet Union was to develop bauxite extraction in Kindia. Ninety percent of the production was to be supplied to the USSR from 1974 up to the year 2005, of which 55 percent would be provided as a compensation for the supply of equipment and the construction of a railway from the mine to the coast, and the rest supplied on commercial terms. The capacity of the mine has been extended and since 1986 the annual output amounts to 3 million tons (the third of the total production in the country, which accounts for one quarter of world reserves). Along the same line, the USSR has concluded co-operation agreements with other bauxite producers in the developing world, such as India (in November 1986, an agreement has been signed for the building of an alumina plant in Korba, which will be repaid by supplies of alumina and aluminium), Indonesia, Jamaica (the agreement, providing for annual sup-

plies of bauxite of 1 million tons and signed in 1982, was renewed in January 1986 for 3 years), and Guyana (on the basis of barter against equipment).

Unlike bauxite, phosphate rock is abundant in the Soviet Union. The costs of extraction are growing due to the unfavorable location of the fields. The USSR is becoming a net importer of this mineral (Nappi, 1985). It is not quite clear whether the agreement with Morocco signed in 1978 for developing the phosphate field of Meskala is being implemented. It provided for supplies of equipment and a credit of 2 billion dollars, partly in hard currencies, to be repaid through supplies of phosphate for 30 years. Though the implementation of the project seems to have lagged behind schedule, the sales of Moroccan superphosphate have strongly increased in value in 1985. In December 1986, the USSR concluded an agreement with Syria for annual supplies of phosphate rock which should amount to 6 million tons in 2000.

Since the Soviet Union is seeking regular sources of supply for some essential minerals, it may be surprising that there are no Soviet-Third World mixed companies in the field of raw materials. As Carl McMillan states, "Soviet equity investments in the sphere of natural resource exploitation in the Third World have been limited to off-shore fishing" (McMillan, 1987, p. 68). A Soviet author acknowledges the fact, noting that the number of Soviet-Third World companies is negligible and their scope of activity is too narrow (Belchuk, ed. 1985, p. 87). The new regulations introduced in January 1987 for the constitution of joint firms with partners from capitalist industrialized and developing countries should give an impulse to this form of involvement in the Third World.

3. *The oil trade: Is reexport still rewarding?*

The Soviet Union has been importing oil from OPEC countries in significant quantities since 1973 (see table 7). After a slump in 1980-82, a marked recovery occurred in 1983-85 (Bahri in Lavigne, ed., 1985, p. 202; Tiraspol'sky, 1986, p. 42). According to Jan Vanous, the Soviet imports of Middle East oil for reexport strongly increased in 1986 (Vanous, 1987, p. 13). Is this going to last?

TABLE 7.—SOVIET OIL PURCHASES FROM THE THIRD WORLD, 1980-85

	[In thousand tons]					
	1980	1981	1982	1983	1984*	1985*
Identified suppliers:						
Iraq	1800		80	2400	4000	3360
Libya	1680	1770	5840	6150	6800	5300
Iran		2200	810	2390	1260	700
Saudi Arabia				1050	1800	2300
Venezuela	40					
Total	3520	3970	6730	11990	14300	13300

Sources: Bahri in Lavigne, ed., 1986, p. 202 (from various sources including UN data (World Energy Statistics) and computations on the basis of Vneshtorgbank Torgovlia SSSR); Tiraspol'sky, 1986; estimates of the author (1984* and 1985*).

Different issues are involved here. The political support of the Soviet Union to the OPEC policy for the restriction of sales, which was promised at the end of 1986, should limit such reexports, at

least for a time. The recovery in arms sales, already noticeable in 1986, should have the reverse effect, as oil is taken in compensation for these sales. The overall restructuring of Soviet foreign trade, which is underway, should limit the role of oil as a hard currency earner for the USSR, but in the long run only. No clear pattern emerges from these contradictory developments.

4. The manufactured goods trade

The LDCs have been pressing the socialist countries of Eastern Europe (USSR included) to expand their imports of Third World manufactures since the Fourth UNCTAD in 1976. The Soviet Union is certainly in a better position than the other CMEA countries in this respect. True, the share of manufactured goods steadily declined in its imports in the seventies and early eighties, but it began to grow in 1982 and has reached in 1984 the 25 percent mark. Should the share of food and of oil decline in the Soviet imports, the proportion of manufactures would increase automatically, even at a lower level of trade.

Several reasons should point toward a greater share of manufactures in the near future:

- (i) the relative increase in trade with exporters of such goods (India, Pakistan, Turkey, Syria, Egypt), along with an activation of import trade with Latin American NICs;

- (ii) the commitment of the Soviet planners and policy-makers to an increase in the supplies of consumers goods on the Soviet market;

- (iii) the new role of the tariff system in the Soviet Union. The USSR is to reactivate its tariff, along with the reform of the foreign trade system and in view of its application to GATT. The goods imported from the LDCs were exempted from taxes since 1965, but the tariff itself did not play any role as the domestic prices were not linked with the external prices. If the tariff is reactivated (and restructured along a detailed enough foreign trade classification), and if the importing entities—foreign trade organizations or enterprises—are to feel the burden of it, then there might be a real incentive to increase imports from the developing countries rather than from the industrialized countries because it will save money;

- (iv) the new impetus toward joint ventures should have the same effect. Already before the publication of the new regulations some Soviet authors firmly supported this solution. "The purchase of processed goods from liberated countries stimulates their national export. A still more marked effect might be obtained through a direct contribution of the USSR toward the creation of industrial capacities which might give an export production. Note that such a contribution has little to do with an imposed from outside upon DCs export-oriented growth strategy" (Belchuk, ed., 1985, p. 169). Another section of the same book advocates "one possible orientation of co-operation in the manufacturing industry—the organization in developing countries of low and middle-technology activities oriented toward a subsequent export of the output to the socialist countries, on the basis of long-term agreements" (p. 93).

Here again comes the warning: "some apparent economic and legal similarities between both (capitalist-owned and socialist-owned, M.L.) types of joint ventures are sometimes viewed by bourgeois authors as a pretext for accusing the Soviet Union . . . in 'transnationalism'. Such external forms also influence up to a certain point the developing countries themselves in their attitude toward such companies" (*ibid.*, p. 91). The statement is quite candid. Joint ventures ought to be developed, in the interests of the DC partner but also, quite explicitly, of the Soviet Union, on the basis of the most classical international division of labor. One should, however, stress that this is also a demand of the developing countries, expressed already in the Arusha Program for collective self-reliance: "the objectives of such joint ventures should be to promote the industrialization of developing countries and to increase the exports of manufactures and semi-manufactured products from those countries" (text of the Program as annexed to the Fifth UNCTAD documents, TD/236).

IV. TRADE BALANCES AND GAINS FROM TRADE

Is the Soviet Union deriving important benefits from its trade with the Third World?

Recent studies have dealt with the issue (Wolf, 1985; Becker, 1986). A first and obvious approach would be related to the terms of trade issue. Is the Soviet Union following the same pattern as the developed market economies in the trade with the LDCs? Is it discriminating against those countries (selling at higher prices than to other partners, buying at lower prices)?

This approach is very deceptive because of statistical limits to an exhaustive knowledge of Soviet import and export prices (see A. Dimitri, in Lavigne, ed., 1985; Graziani, 1986).

In addition, there is a strong link between the settlement regime and the price. The USSR still conducts a significant part of its foreign trade with the DCs under the regime of clearing agreements (about 40 percent in the first part of the eighties). Apart from the official clearing agreements (with Afghanistan, Bangladesh, Egypt, India, Iran, Pakistan, Syria), there is a wide range of barter deals on an ad hoc basis, with swaps between specific goods (in particular, in oil and arms trade). Finally, the mechanism of co-operation is deeply interwoven with trade, in all the cases when a long-term credit in kind is granted in the form of machinery supplied, to be repaid by deliveries of traditional export goods or commodities originating from the project financed through credit. In this case the import price paid by the Soviet Union is linked not only with the (generally unknown) price for machinery, but also with other conditions such as the interest rate, the amount of technical assistance, etc.

Finally, one has to take into account the balances in trade, overall and according to the payment regimes.

The Soviet Union has a permanent surplus in its overall trade with the developing world. It is always (with only two exceptions since 1970, that is in 1978 and 1979) in deficit with its identified partners, because of the huge residual in its exports. The residual itself leads to a hard currency revenue which amounts to at least

60 percent of its total sum, and even more according to some experts (Zoeter, 1982). In its clearing trade the Soviet Union has a surplus (which amounted in 1985 to almost 600 million dollars). This surplus logically has to be deducted from the hard currency gains of the same year as it does not entail hard currency proceeds.

According to such a computation, the Soviet Union appears to be in deficit with the Third World (in hard currency) by a small amount in 1985 though its overall surplus amounts to 2.4 billion dollars. Significantly, in 1986 the deficit with identified partners was strongly cut, while the surplus in clearing was reduced to less than 100 million dollars, leaving a net hard currency surplus of more than 1.2 billion dollars. This again confirms one of the basic interests—more than ever—of the Soviet Union in the Third World.

BIBLIOGRAPHY

- Aleshin, I.V., Ivanov, I.D., Sheinis, V.L., eds. (1983), *Razvivaiushchiesia strany v sovremennom mire: edinstvo i mnogoobrazie* (The developing countries in the contemporary world: unity and diversity), Moscow, Nauka, 300 p.
- Bahri, Sonia (1986), "Les relations économiques entre les pays socialistes européens et l'OPEP", in Lavigne, ed. (1986), pp. 171-203.
- Becker, Abraham S. (1986), "The Soviet Union and the Third World: The Economic Dimension", *Soviet Economy*, vol. 2, n° 3, pp. 233-260.
- Belchuk, A.I., ed. (1985), *SSSR—razvivaiushchiesia strany—Torgovo-ekonomicheskie otnosheniia* (The USSR and the developing countries: commercial and economic relations), Moscow, Mezhdunarodnye Otnosheniia, 240 p.
- Bogomolov, O.T. (1986), *Strany sotsializma v mezhdunarodnom razdelenii truda* (Socialist countries in the international division of labour), Moscow, Nauka, 1980 (first ed.), 368 p.; 1986 (second ed.), 414 p.
- Cassen, Robert, ed. (1985), *Soviet Interests in the Third World*, London, The Royal Institute of International Affairs, Sage Pub., 329 p.
- Després, Laure (1986), "Les ventes d'armes de l'URSS et des six pays socialistes européens aux pays en voie de développement", in Lavigne, ed. (1986), pp. 57-73.
- Dimitri, Alexandre (1986), "Le système des prix", in Lavigne, ed., 1986, pp. 79-89.
- Don, Dominique (1986), "Les relations économiques entre les pays socialistes européens et les pays à orientation socialiste observateurs au CAEM", in Lavigne, ed. (1986), pp. 147-169.
- Dzharasov, S.S., ed. (1985), *Ekonomicheskie problemy razvitiia stran sotsialisticheskoi orientatsii* (Economic problems of development of countries with a socialist orientation), Moscow, Nauka, 240 p.
- Farizov, I.O., ed. (1986), *Razvivaiushchiesia strany v sovremennykh mezhdunarodnykh otnosheniakh* (The developing countries in the contemporary international relations), Moscow, University of Moscow, 288 p.
- Graziani, Giovanni (1984), "Commercial Relations Between Developing Countries and the USSR: Recent Trends and Problems", AISSEC, Torino, to be published in the Cambridge Journal of Economics.
- Graziani, Giovanni (1986) "Soviet Prices in Trade with Developing Countries: An Empirical Analysis of the 1981-84 Period", paper presented at the annual meeting of the AISSEC, Siena, 17-18 October 1986, 17 p., mimeo.
- Khaldine, M. (1986), "Selon une ligne ascendante" (the article deals with Soviet-Third World agreements), *Commerce Extérieur* (URSS), n° 6, pp. 8-12.
- Kouznetsov, G. (1986), "L'état et les perspectives des relations d'affaires avec les pays d'Afrique tropicale", *Commerce Extérieur* (URSS), n° 9, pp. 21-24.
- Lavigne, Marie (ed.) (1986), *Les Relations Est-Sud dans l'économie mondiale* (to be published in English by Westview Press, 1987, *East-West Relations in the World Economy*), Paris, Economica, 346 p.
- Lavigne, Marie (1986), "Eastern Europe—LDC Economic Relations in the Eighties" in *East European Economies: Slow Growth in the 80's*, vol. 2, Foreign Trade and International Finance, Joint Economic Committee, Congress of the United States, Washington, D.C., USGPO, pp. 31-61.
- Machowski, Heinrich, Schultz, Siegfried (1986), "Wirtschaftsbeziehungen der UdSSR zur Dritten Welt: Handel and Hilfe", *DIW Wochenbericht*, n° 22/86, p. 276-281.

- McMillan, Carl (1987), *Multinationals From the Second World, Growth of Foreign Investments by Soviet and East European State Enterprises*, London, Macmillan, 220 p.
- Nappi, Carmine (1985), "East-West Mineral Trade: Understanding Recent Trends" *Cahiers de Recherche de l'Institut d'Economie Appliquée*, Montreal, n° 85-07, August, mimeo.
- Ossadtchouk, E. (1987), "La coopération économique et technique de l'URSS avec les pays arabes et ses perspectives", *Commerce Extérieur* (URSS), n° 1, pp. 24-29.
- Ryjkov, M. (1986), "La contribution soviétique à la mise en valeur des ressources minérales des pays en développement", *Commerce Extérieur* (URSS), n° 7, pp. 20-24.
- Smith, Alan H. (1985), "Soviet Trade Relations with the Third World", in Cassen, ed. (1985), pp. 140-158.
- Tiraspolsky, Anita (1983), "Le CAEM et ses partenaires privilégiés du Tiers Monde: Angola, Ethiopie, Mozambique, Yemen du Sud, Afghanistan", *Le Courrier des Pays de l'Est*, n° 274, June 1983, pp. 3-34.
- Tiraspolsky, Anita (1986), "Le commerce extérieur de l'URSS par produits, en 1985", *Le Courrier des Pays de l'Est*, n° 308, July 1986, pp. 35-43.
- Tiraspolsky, Anita (1987), "Les relations économiques de l'URSS et de l'Europe de l'Est avec les pays observateurs au CAEM", *Le Courrier des Pays de l'Est*, n° 314, January 1987, pp. 3-42.
- Ushakova, N. (1980), *Strany SEV i razvivaiushchiesia gosudarstva* (CMEA countries and countries with a socialist orientation), Moscow, Nauka, 184 p.
- Valkenier, Elizabeth K. (1983), *The Soviet Union and the Third World: An Economic Bind*, New York, Praeger, 189 p.
- Vanous, Jan (1987) "Soviet foreign trade performance during the first nine months of 1986: coping with a 15% deterioration in non-socialist terms of trade", *Plan-Econ Report*, vol. III, n° 1, January 7.
- Vanous, Jan (1981), "Soviet and East European Foreign Trade in the 70s: A Quantitative Assessment", *East European Economic Assessment*, vol II, Joint Economic Committee, Congress of the United States, Washington D.C., pp. 685-715.
- Wolf, Thomas A. (1985), "An Empirical Analysis in Soviet Economic Relations with Developing Countries" *Soviet Economy* vol. 1, n° 3, July-September, pp. 232-260.
- Wolf, Thomas A., Hewett, Ed.A. (1982), "A Puzzle in Soviet Foreign Trade Statistics and Possible Implications for Estimates of Soviet Arms Exports to Developing Countries", in *Soviet Economy in the 1980's: Problems and Prospects*, vol. 2, Joint Economic Committee, Congress of the United States, Washington D.C., USGPO, pp. 575-581.
- Zevin, L.Z., ed. (1985), *Strany SEV i razvivaiushchiesia gosudarstva, 80-e gody* (CMEA countries and developing states in the 80s), Moscow, Nauka, 248 p.
- Zevin, L.Z. (1985), *Strany razlichnogo urovnia v mirovom khoziaistve: problemy ekonomicheskikh otnoshenii* (Countries with different levels of development in the world economy: problems of economic relations), Moscow, Nauka, 196 p.
- Zoeter, Joan Parpart (1982), "USSR: Hard Currency Trade and Payments", in *Soviet Economy in the 1980's: Problems and Prospects*, vol. 2 Joint Economic Committee, Congress of the United States, Washington, D.C., USGPO

MOSCOW'S ECONOMIC AID PROGRAMS IN LESS-DEVELOPED COUNTRIES: A PERSPECTIVE ON THE 1980'S

By Carol Fogarty* and Kevin Tritle**

CONTENTS

	Page
Summary	532
I. The program in non-Communist LDC's: New challenges.....	532
A. Trends in the 1980's.....	533
B. A more expensive program.....	534
C. Measuring the payoff.....	536
II. Economic aid to Communist LDCs: A continuing obligation.....	538
A. Trends in the 1980's.....	539
B. Program returns	539
III. Looking ahead.....	540

SUMMARY

More than 30 years since it made its first economic aid commitment to a less developed country (LDC), the USSR finds its aid program at a crossroads. Party Chairman Gorbachev, trying to reform Soviet economic practices and rationalize the economy, must soon decide the future of this longstanding effort. In the 1980s, the program has been characterized by rising aid costs, declining political returns, and competing demands for resources at home. Moscow's economic programs in Communist LDCs, which absorb nearly 90 percent of its total aid to developing nations, will likely remain intact because of these countries' political and strategic significance to Soviet foreign policy. On the other hand, continued Soviet resource flows to the non-Communist Third World appear vulnerable to the Chairman's cost-cutting measures, particularly because (a) demands from Marxist LDCs are becoming harder to reconcile with Soviet economic realities, and (b) several long-term clients have opened dialogues with the West because they are dissatisfied with Soviet economic aid, reducing the program's attractiveness to Moscow as a political tool. At the very least, Soviet planning officials will be calling for new initiatives in non-Communist LDC programs that will increase their profitability and political effectiveness.

I. THE PROGRAM IN NON-COMMUNIST LDCs: NEW CHALLENGES

During Party Chairman Gorbachev's first year and a half of leadership, there has been little indication that he has addressed the

*Analyst, Office of Global Issues, CIA.

**Analyst, Office of Soviet Analysis, CIA.

economic and political issues posed by Moscow's economic aid to the non-Communist developing world. While Gorbachev has announced his intent to act more vigorously to protect Soviet interests in the Third World, he is faced with spiraling aid costs never before seen in the Soviet program as Marxist clients (such as Afghanistan, Angola, and Ethiopia) claim ever-growing resources to salvage their crumbling economies. In addition, Moscow's steady cash customers—Libya, Iran, and Iraq—are caught in a revenue squeeze because of falling oil prices or production and export problems and will require substantial project financing just to maintain Moscow's market shares. This comes at a time when Moscow's own petroleum earnings have plunged—by \$4 billion in 1985, and probably as much in 1986.

In spite of these pressures, Gorbachev so far has maintained the aid program at earlier levels. Through 1985, Soviet economic pledges were roughly the same as in the previous years, and were destined mainly for traditional recipients such as the Marxist states, and countries along its border. In a major breakthrough in the Pacific, Moscow also concluded its first economic agreement with a developing island state—a fishing agreement with Kiribati. This pact was commercially focused, but the USSR also offered financing for shore facilities on the island, which could also serve the Soviet fleet.

In 1985, Gorbachev's more realistic approach to domestic economic problem-solving seemed to spill over into LDC foreign aid matters indirectly through the planning process. Among client states, which represent a potentially significant drain on the Soviet economy through the end of the century, Moscow is cautioning slower movement toward socialization. In Ethiopia, for example, in November 1985 Soviet planning experts recommended such policy reforms as strengthening the private sector, materially assisting private farmers, and adopting a market-oriented approach to selling, pricing, and distribution to stimulate growth in Ethiopia's stagnant economy. These recommendations contrast sharply with earlier doctrine that did not allow transitional stages to convert institutions to socialism in Marxist states. The planners also prescribed substantial investments in infrastructure, agricultural industry, and energy, without commenting on potential Soviet contributions.

A. TRENDS IN THE 1980S

Chairman Gorbachev inherited a 30-year-old aid program already recovering from the drift that resulted from turmoil in the Soviet leadership during the early 1980's. Economic commitments in 1983 and 1984 totaled more than \$5 billion, while disbursements in those years reached nearly \$1.5 billion a year. Transactions since Gorbachev assumed power in 1985 continued this general trend, reinforcing a pattern we have seen in the 1980's:

Marxist client states have received more than one-third (\$4.5 billion) of the \$12.5 billion of pledges in the 1980s to support economies that are becoming dependent on the USSR to replace declining aid from the West. This is an extremely high

degree of concentration on one set of recipients, even for the Soviet program.

Grants have absorbed a little over 11 percent of new pledges in the 1980's: most of them have gone to Marxist states. Earlier, grant aid accounted for less than 5 percent of total pledges.

Trade credits have expanded from less than 10 percent to nearly one half of total pledges commitments. These credits, which Moscow uses to finance development projects and equipment sales for most traditional recipients, have been the fastest-growing element of the program because they are profitable for the USSR.

TABLE 1.—USSR: ECONOMIC AID EXTENDED TO NON-COMMUNIST LDCs

(In millions of U.S. dollars)

	Trade credits	Concessional credits/grants	Total	Marxist client states	Other LDCs
Total ¹	8,935	23,970	32,915	7,140	25,775
1954-79.....	2,900	17,470	20,375	2,685	17,690
1980.....	640	1,965	2,605	1,185	1,420
1981.....	590	255	845	215	630
1982.....	420	610	1,030	955	75
1983.....	2,015	1,170	3,185	590	2,595
1984.....	1,765	715	2,480	880	1,600
1985.....	605	1,785	2,390	625	1,765

¹ Because of rounding, components may not add to the totals shown.

B. A MORE EXPENSIVE PROGRAM

There are signs that the program, which has been self-sustaining for two decades, has cost the Kremlin money over the last three years. For example:

Moscow provided at least \$1.5 billion of credits to Iraq, formerly a dependable source of cash for Soviet equipment and services. The Iran/Iraq war and the decline in the oil market are forcing Moscow to provide more financing to retain equipment markets in the Middle East.

The USSR is providing oil on credit to Madagascar, Mozambique, and Nicaragua, and oil subsidies to Ethiopia. Soviet oil financing for non-communist LDCs since 1982 now totals \$550 million.

The USSR probably has funded South Yemen's \$100-150 million annual trade deficit, an investment whose risky nature was underlined by the Civil War in 1985-86.

Moscow rescheduled or restructured debt payments for Afghanistan, Ethiopia, Mozambique, Madagascar, Peru, Syria, and South Yemen.

Moscow's economic commitment to Marxist states over the past five years has raised the direct costs of maintaining Soviet influence through the economic program. Every year the USSR has been forced to provide petroleum, food grains and other commodities to client states—obligations that never will be repaid. The Marxist clients of the 1980s cannot absorb the large public sector

industrial projects that Moscow has relied on to attain its politico-economic objectives in LDCs. Instead, the troubled economies of Afghanistan, Ethiopia, and Nicaragua require Soviet commodities and development aid for agriculture and basic infrastructure amounting to nearly half a billion dollars a year, the largest out-flow Moscow's economy has ever sustained through the economic program.

TABLE 2.—USSR: ECONOMIC AID DELIVERIES TO NON-COMMUNIST LDCS

[In millions of U.S. dollars]

	Total	Of which: grants
Total.....	16,035	1,845
1954-79.....	8,310	435
1980.....	945	305
1981.....	920	200
1982.....	1,340	160
1983.....	1,640	345
1984.....	1,475	195
1985.....	1,405	205

The USSR's commitment to aid Marxist states has affected disbursements even more dramatically than pledges. Grant aid has set new records in the 1980's, and nearly one-third of deliveries (under both credit and grant agreements) has consisted of commodities to support the economies of the client states. This has meant that:

The larger proportion of grants and commodities, which are easier to implement than development projects, have raised average annual disbursement totals to \$1.5 billion in the past three years, substantially exceeding reflows to the Soviet economy through economic repayments.

Commodity aid has risen to about 25 percent of annual disbursements compared to less than 5 percent before 1980.

Higher grant deliveries have raised the grant elements in the Soviet aid program in the last three years, according to our calculations. However, we expect the Soviet grant element to decline as new project deliveries commence under trade credits that carry relatively hard repayment terms.

To recover resources lost through concessional flows, Moscow is trying to maximize returns from its economic programs in non-socialist countries, which still make up most of its aid clientele in spite of flashy allocations to Marxist states. Recent agreements (with the notable exception of the \$1.2 billion Indian credit in 1985) have been characterized by shorter grace and repayment periods and higher interest rates. In the 1980's, Moscow has directed nearly \$4 billion of these harder credits to Arab clients, where investments are most secure, to exploit their still-lucrative markets and to increase its development presence in this key target area. Most of these funds have been provided as trade-type credits, carrying 10-year terms at interest ranging from 4 percent upward, and repayable in hard currency or equivalent goods. Moscow probably hopes that these programs will again finance the USSR's activities

in Marxist LDCs as they have in the past by providing a steady flow of hard currency and raw materials annually as repayments.

C. MEASURING THE PAYOFF

In spite of rising costs, the USSR's economic program in non-Communist LDCs still produces substantial benefits to the Soviet economy by allowing Moscow to:

Sell upwards of a billion dollars a year worth of equipment on credit to LDCs, which absorb 25 percent (more than \$2 billion worth) of total Soviet equipment exports under both credit and commercial arrangements.

Maintain 40,000 Soviet personnel in LDCs, some employed in influential positions.

Earn \$150-200 million a year in hard currency for technical services associated with economic aid and other services programs in LDCs.

Guarantee flows of bauxite, oil, natural gas, phosphates, steel, and other products valued at about \$2 billion annually from Soviet-built projects in LDCs.

Underwrite at least one-third of its annual catch with fish from LDC coastal waters.

Earn prestige through its willingness to finance projects turned down by the West (such as the Aswan Dam).

Recent developments in non-Communist LDCs, however, threaten to erode political and economic benefits from the program. For example, because of its political nature Soviet aid has never really addressed the basic long-term development needs of most LDCs. Thus, in spite of the increased resources Moscow has devoted to its program in recent years, friends and foes alike have become critical of the level of Soviet aid and its failure to improve their economies; some Soviet allies in LDCs are seeking new economic accommodations with the West.

Among the Marxist states, Angola and Mozambique have encouraged increased aid and investment from the West, while Ethiopia has relied almost entirely on Western donations to feed its starving populations.

Socialist countries such as the Congo, Guinea, Mali, Madagascar, and a number of other smaller African states are turning to the West to rebuild their economies.

Although Moscow has typically relied more on military programs to preempt Western influence and maintain its own, we believe Moscow's loss of credibility in the economic field is subtly affecting Soviet policy interests in these countries. For example, long-time aid clients Congo, Guinea, Mali, and Mozambique did not support the Soviets in the November 1985 UN resolution condemning the Soviet invasion of Afghanistan.

On the economic side, there is a real prospect that the protracted deterioration in the economies of Marxist client states will accelerate, making the aid program unacceptably expensive. This trend is already in motion: The 1984 agreement to supply oil on credit to Nicaragua, for example, will add up to \$100 million in annual disbursements that will never be repaid. Similarly, the devastation in

Afghanistan is costing Moscow about \$500 million a year, according to some sources.

This continuing high level of support to Marxist states seems to result from policies in place before Gorbachev assumed leadership, rather than policy decisions by the new government. We have seen no evidence that Soviet officials have yet focused on the impact that domestic economic changes will have on the aid program, nor the implications for Soviet policy of growing disbursements of free food and other commodities. In any event, Moscow will not want to exceed current levels of expenditure.

TABLE 3.—USSR: ECONOMIC CREDITS AND GRANTS EXTENDED TO NON-COMMUNIST LDCs

(In millions of U.S. dollars)

Recipient	1954-85	1980	1981	1982	1983	1984	1985
Total ¹	32,915	2,605	845	1,030	3,185	2,480	2,390
North Africa	4,190	315	300	Negl	280	Negl	355
Algeria	1,935	315	300		250		340
Mauritania	35			Negl	Negl	Negl	15
Morocco	2,100						
Tunisia	125				25		
Sub-Saharan Africa	4,855	330	155	710	310	575	215
Angola	525			410	NA	50	NA
Benin	15		5				
Burkina	5					Negl	Negl
Cameroon	10						
Cape Verde	10		Negl			Negl	
Central African Republic	5						
Chad	5						
Congo	75	Negl	30				
Equatorial Guinea	5			Negl		Negl	Negl
Ethiopia	1,300	190	60	230	265	275	Negl
Gambia	Negl						
Ghana	110		Negl	10	Negl	5	
Guinea	405	5				165	5
Guinea Bissau	35		Negl	15			
Kenya	50						
Liberia	Negl	Negl					
Madagascar	215	50		5		30	105
Mali	135	Negl	5	20		15	
Mauritius	15					10	
Mozambique	310	85	45	5	15	5	90
Niger	Negl						
Nigeria	1,205						
Rwanda	Negl						
Sao Tome Principe	NA						
Senegal	10						
Seychelles	40				5	20	10
Sierra Leone	35		Negl				Negl
Somalia	165						
Sudan	65						
Tanzania	45			5			NA
Togo	Negl					Negl	Negl
Uganda	35				10		Negl
Zaire	Negl						Negl
Zambia	30		5		10		
East Asia	260						
Burma	15						
Cambodia	25						
Indonesia	215						
Laos	5						
Latin America	2,415	250	170	230	215	325	210

TABLE 3.—USSR: ECONOMIC CREDITS AND GRANTS EXTENDED TO NON-COMMUNIST LDCs—
Continued

[In millions of U.S. dollars]

Recipient	1954-85	1980	1981	1982	1983	1984	1985
Argentina.....	295				70	NA	
Barbados.....	Negl				Negl		
Bolivia.....	190			Negl	70		
Brazil.....	160		55		15		
Chile.....	240						
Colombia.....	215					NA	
Costa Rica.....	15						
Ecuador.....	35		35				
Grenada.....	10	Negl	Negl	10			
Guyana.....	10					10	
Jamaica.....	40				10		
Mexico.....	NA					NA	
Nicaragua.....	870	NA	80	215	50	315	210
Peru.....	275	250			Negl		
Uruguay.....	60						
Venezuela.....	NA						
Middle East.....	11,575	210	110		1,630	1,345	
Cyprus.....	15						
Egypt.....	1,440						
Greece.....	440				360	70	
Iran.....	1,165						
Iraq.....	2,180				1,000	455	
Jordan.....	30					NA	
North Yemen.....	195		55				
South Yemen.....	800	210					
Syria.....	1,915		55		270	820	
Other.....	3,400						
South Asia.....	9,620	1,505	110	95	750	235	1,605
Afghanistan.....	3,340	705	25	90	260	235	325
Bangladesh.....	515		70		70		80
India.....	4,420	800			140		1,200
Nepal.....	30			5			
Pakistan.....	1,210		10		275	NA	
Sri Lanka.....	100						

¹ Because of rounding, components may not add to the totals shown.

II. ECONOMIC AID TO COMMUNIST LDCs: A CONTINUING OBLIGATION

Moscow's economic program in the Communist developing countries (Cuba, Vietnam, Mongolia, North Korea, Laos and Cambodia) differs dramatically in both content and implication from the penetration effort in non-Communist LDCs. Politically, Moscow is obligated to support these fraternal Communist states to maintain its standing within the Communist world. This aid focuses on reinforcing Communist economic institutions and practices already in place, rather than on introducing new economic systems or increasing market shares. The USSR's aid relationship with the largest among this group of recipients (Cuba, Mongolia, and Vietnam) has been institutionalized through full CEMA membership, a status still denied all other Third World countries.

While Gorbachev may wish to cut costs in economic programs in Communist LDCs, his room to maneuver probably is severely limited. The reputation of the Communist economic model for the Third World is linked to the fate of these poverty-stricken, inefficient,

vulnerable economies. Because of their dependence on Soviet aid for survival, these countries receive about 85 percent of the USSR's annual aid allocations.

TABLE 4.—USSR: ECONOMIC AID DELIVERIES TO COMMUNIST LDCs

[In millions of U.S. dollars]

	Total	Economic aid	Subsidies
Total	53,990	23,255	30,735
1976-79	14,770	5,210	9,560
1980	5,555	2,315	3,240
1981	6,785	3,275	3,510
1982	6,840	3,020	3,820
1983	6,410	3,185	3,225
1984	6,665	3,035	3,630
1985	6,965	3,215	3,750

A. TRENDS IN THE 1980'S

When subsidies are added in, Soviet economic aid to Communist LDCs each year is four times higher and much more concessional than aid to non-Communist LDCs.¹ Soviet aid pledges to this group of countries have grown steadily for two decades, peaking in 1985 at \$6.9 billion. The aid has been about evenly divided between direct aid (credits and grants to projects and budget support), and trade subsidies (grants that result from concessionary pricing policies, measured as the difference between Soviet prices and world prices). Moscow does not usually provide subsidies to non-Communist LDCs; it is these flows that make the Soviet program in Communist LDCs so generous.

Another feature that differentiates the aid program in Communist LDCs is the larger hard currency component. In the 1980's, the USSR has provided about \$800 million a year in hard currency support to Cuba and Vietnam by allowing Havana to resell some of the oil provided, purchasing some Cuban sugar for hard currency, and financing some imports from third countries.

Cuba claims far more of Moscow's aid resources than any other LDC, about \$4.5 billion annually (half of Moscow's total). Price subsidies to Cuba on Soviet oil and Cuban nickel have generally accounted for about three-fourths of these disbursements. Vietnam is the USSR's second largest recipient with about \$1 billion a year for raw materials, petroleum products, essential industrial commodities, and project aid. Mongolia receives almost as much as Vietnam to support the pervasive Soviet development presence, and to cover essential imports.

B. PROGRAM RETURNS

Economic benefits to the USSR from aid to Communist LDCs are elusive when compared to returns from non-Communist LDCs. The large annual trade subsidies provided to CEMA LDCs represent

¹ Price subsidies generally are not included in published Western aid totals; therefore, to compare Soviet and Western aid, the subsidies must be removed from Soviet figures.

substantial opportunity costs for the USSR, while direct hard currency support to these countries nearly equals annual expenditures on the non-Communist programs. In addition, Moscow also has rescheduled or canceled debt for Cuba, Mongolia, and Vietnam.

Political and strategic benefits, on the other hand, are abundant. Cuba remains Moscow's most important strategic asset in the Western Hemisphere, while both Cuba and Vietnam supply the Soviet fleet with port access and other services far from home waters. Communist LDCs also have been aggressive in promoting the USSR's political positions on various international issues. For example, Cuba and Vietnam are so effective in pushing Moscow's hardline views within the Nonaligned Movement that other members are often forced to compromise their own positions to reach consensus.

TABLE 5.—USSR: ECONOMIC AID DELIVERIES TO COMMUNIST LDCs

	(In millions of U.S. Dollars)									
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Cuba.....	1,570	2,270	2,945	3,180	3,465	4,560	4,665	4,260	4,620	4,650
Economic aid.....	185	230	320	460	830	1,415	975	1,070	1,000	900
Subsidies.....	1,385	2,040	2,625	2,720	2,635	3,145	3,690	3,190	3,620	3,750
Vietnam.....	350	410	470	770	935	1,120	1,000	1,040	1,040	1,200
Economic aid.....	305	290	335	570	580	900	950	1,025	1,040	1,200
Subsidies.....	45	120	135	200	355	220	50	15		
Mongolia.....	490	620	690	685	835	830	885	885	785	885
Economic aid.....	445	575	660	640	770	765	865	880	785	885
Subsidies.....	45	45	30	45	65	65	20	5		
North Korea.....	65	45	35	75	260	145	130	40	55	30
Economic aid.....	35	15	15	30	75	65	70	25	45	30
Subsidies.....	30	30	20	45	185	80	60	15	10	..
Laos and Cambodia.....	15	30	20	35	60	130	160	185	165	200

III. LOOKING AHEAD

Beyond prescribing in general terms the continuation of aid to socialist-oriented states, the CPSU draft program issued in October 1985 offers few insights into Soviet economic aid plans through the end of the decade. Because important political and strategic interests are closely linked with the welfare of the Communist LDCs, the USSR may even increase aid to these countries to foster greater self-sufficiency and possibly to increase their export potential to the Soviet market. Moscow will target energy projects to decrease the burden of oil shipments to Communist LDCs (currently almost 10 percent of Soviet oil exports), and projects that produce agricultural goods and raw materials that can be used in the USSR. Trade and aid agreements with Cuba and Vietnam through 1990 call for increased project assistance.

Even if Gorbachev wanted to increase concessionary aid to non-Communist LDCs, he probably would meet with stiff opposition because of competing demands at home. The LDC aid issue has been extensively studied over the past several years, and the conclusions have favored a get-tough policy with recipients. Assuring adequate returns from aid and trade relations with non-Communist LDCs has become paramount in the past two or three years because of

growing difficulties in the Soviet economy and incessant LDC demands for assistance.

New directions probably will be necessary to make the program palatable to Soviet planners. Proposals under study include:

Joint ventures with wealthier LDCs, possibly with Soviet equity participation that would assure timely deliveries of certain products to the USSR.

Participation in tripartite economic ventures, in which Western firms provide high technology, the Soviets medium technology, and the LDCs manpower and raw materials.

Cooperation within third countries, such as the recent Brazilian-Soviet deal to construct a hydropower project in Angola.

Production sharing, where Soviet-built facilities in poor LDCs produce raw materials, food, and labor intensive goods, such as textiles, for the Soviet market.

Reducing concessional relationships with countries such as India, where rupee imports from the USSR (including oil) subsidize India's competition on international markets.

These prescriptions are diametrically opposed to what most LDCs (particularly the Marxist states that would be most deeply affected) will demand from the Soviets. For now, Gorbachev may have to maintain the flow of commodities to Marxist states just to preserve the relationship: there is some evidence that low economic aid levels are causing increasing friction with several Marxist regimes. Development projects on the drawing board—such as hydropower and irrigation schemes in Ethiopia and Nicaragua, and oil exploration in South Yemen—almost certainly will go forward as planned.

Among non-Marxist LDCs, we foresee no reduction in the economic effort in Arab states and some South American countries, which are important to Moscow as sources of raw materials and hard currency and as outlets for Soviet machinery and equipment. In fact, aid allocations to this group may grow as Moscow exploits markets in these countries by offering new product lines and more creative financing. For example, several LDCs have received Soviet offers of nuclear powerplants which each could require as much as \$2 billion of credits. Moscow also has adjusted to dislocations in oil markets and plunging world prices by revising contract terms for major Middle Eastern customers, increasing their importance in the Soviet aid picture. Moscow already has upward of \$10 billion worth of hard currency development contracts under negotiation with non-socialist countries; Soviet economic officials are unlikely to allow financing questions to jeopardize their successful conclusion.

NOTE ON SOURCES

The detailed information on Soviet foreign aid contained in this study is drawn from numerous official and non-official publications available to the public. A primary source for data concerning the Soviet economic program in LDCs—aid extensions, drawings, and technical assistance—is the annual review of Communist economic aid programs published by the Department of State. The most recent of the series, "Warsaw Pact Economic Aid to LDCs," appeared in May 1986.

Official publications, journals, and newspapers from LDCs and the USSR also have been valuable sources, particularly the USSR Ministry of Foreign Trade's foreign trade yearbook series and monthly foreign trade magazines. Other useful sources include publications of the United Nations and the Organization for Economic Cooperation and Development.

COMMENTARY

By Roger E. Kanet*

SUMMARY

In the past Soviet ability to compete with the United States on a global basis has been based primarily on its military capabilities. However, the weakness of the Soviet economy places limits on Soviet efforts to establish itself as a global superpower. This is especially evident in the Third World where issues of economic development are of increasing concern. To a substantial degree the Soviet Union is irrelevant to the needs and concerns of newly-industrialized states, because of its limited ability to provide development capital or markets for these countries.

The Soviet leadership is aware of these and other problems that face it in its policy in the Third World, although there is little evidence to date that the reassessment of policy taking place in Moscow is having an impact on actual Soviet behavior.

Finally, Gorbachev's plans for the economic revitalization of the Soviet Union require the expansion of Soviet trade and, thus, the increased efficiency of the foreign trade sector.

The preceding chapters have examined various aspects of recent Soviet foreign economic policy, with special reference to the re-vamping of the foreign trade institutions, developments in U.S.-Soviet trade, and Soviet trade and aid policy toward developing countries. The present brief commentary is meant to supplement the other contributions to this section on Soviet foreign economic relations by discussing two issues of growing importance to an understanding of the place of foreign economic relations in the overall policy of the Soviet state. The first issue relates to the detrimental impact of the overall weak international economic position of the USSR in the effort of Soviet leaders to compete with the United States as a global superpower, in particular in the Third World. The second and related issue concerns the recognition among Soviet decision makers of the significance of this weakness and, thus, the place of the foreign trade sector in General Secretary Gorbachev's plans for the revitalization of the Soviet economy.

As other analysts have noted, the current global superpower status of the USSR rests almost exclusively on its nuclear and conventional military capabilities, while the comparative backwardness of the Soviet economy places severe limits on the Soviet ability to exert influence outside the military-security area.¹ This weak-

* University of Illinois at Urbana-Champaign.

¹ See, for example, two recently-published studies which develop this argument at some length: Paul Dibb, *The Soviet Union: The Incomplete Superpower*. Urbana-Chicago: University of Illinois Press, 1986, and Zbigniew Brzezinski, *Game Plan: A Geostrategic Framework for the Conduct of the U.S.-Soviet Contest*. Boston-New York: The Atlantic Monthly Press, 1986.

ness is especially evident in Soviet relations with developing countries, as Carol Fogarty and Kevin Tritle note above when they conclude that "Moscow's loss of credibility in the economic field is subtly affecting Soviet policy interests in these [socialist developing] countries."²

THE SOVIET UNION AND THIRD WORLD ECONOMIC DEVELOPMENT

The Soviets have claimed persistently over the years that their economic relations with developing countries differ essentially from those of the capitalist West. Not only do they lack the supposedly exploitative characteristics of Western aid and trade, but the Soviet Union purportedly provides a stable and growing market for the exports of LDCs, including their industrial products, thereby supporting efforts in the latter to expand and diversify their overall industrial capacity. However, the existing evidence indicates that, for the most part, the reality of Soviet trade with developing countries is quite different. Trade data show that, with relatively few exceptions, the USSR exports weapons, machinery and equipment, plus petroleum, in return for mineral raw materials, foodstuffs and agricultural products, plus modest amounts of handicraft and light consumer goods. Even the structure of Soviet trade with the three least developed members of the CMEA (Cuba, Mongolia and Vietnam) differs little from that found in trade between other developing countries and the West.³ Except for a very few countries like India, the USSR's Third World trading partners have not found a market for substantial amounts of industrial exports in the USSR or Eastern Europe. In large part this derives from the fact that the Soviets conduct very little trade with the newly-industrialized countries (NICs) where rapid growth in the industrial sector has been occurring (e.g. South Korea, Taiwan, and Brazil).

In part the limited nature of Soviet commercial relations with the NICs results from the fact that these countries have not proven to be amenable to Soviet political blandishments. Just as important, however, is the fact that to a very substantial degree the Soviet Union is simply not relevant to their economic needs. Their economic development programs have been based in large part on the acquisition of foreign investment capital, technology and production licenses and on the export of an expanding range of industrial products on the world market. The Soviets have proven to be neither a source of capital and technology nor a market for industrial exports. In fact, as Kazimierz Poznanski has demonstrated, the Soviet Union and Eastern Europe increasingly find themselves in competition with the NICs for markets in OECD countries for their industrial exports. By 1981, for example, the share of the NICs in OECD imports of manufactures (i.e. chemicals, manufactured products, machinery and equipment) had reached 7.4 percent, while that of the European members of the CMEA, including the

² Carol Fogarty and Kevin Tritle, "Moscow's Economic Aid Programs in Less-Developed Countries: A Perspective on the 1980's," above, in this volume.

³ See, for example, Giovanni Graziani, "The Non-European Members of the CMEA: A Model for Developing Countries?" in *The Soviet Union, Eastern Europe and the Developing States*, ed. by Roger E. Kanet. Cambridge: Cambridge University Press, forthcoming. See, also, Siegfried Schultz and Heinrich Machowski, "CEMA Countries: Economic Relations with the Third World," *Intereconomics*, XXI (1986), pp. 194-202.

USSR, had stagnated at a mere 1.2 percent. Taiwan alone sold more than twice as much machinery and transport equipment to the industrialized West than all CMEA countries combined. Latin American exports of machinery and transport equipment were also more than double those of the European communist states.⁴ A closer examination of the trade data discloses the fact that the NICs not only surpass the CMEA countries in the export of the traditional manufactures which predominate in Soviet and East European exports to the West, but even more so in advanced goods such as computers, electronic equipment and synthetic drugs.⁵ It is to be expected that this competition will soon extend to trade between the NICs and the other developing countries. In fact, in the area of arms exports to the Third World, where the Soviets and their East European allies have played such a major role in the past two decades, Third World arms producers (such as Brazil, Israel and Egypt) have already begun to expand their sales.⁶

The major constraints on the Soviets in their economic relations with developing countries stem from internal problems facing the Soviet economy. The limited nature of the resources available to the Soviets for their Third World activities, the inability to provide technology of the type desired by a growing number of LDCs, and, just as important, the fact that the USSR plays such a minimal role in international financial and trade organizations mean that for the those developing countries which are making economic progress and undergoing rapid industrialization the USSR is likely to remain only a marginal actor.

In some respects recent Soviet experience with India is indicative of the problems that they face as they deal with countries for which economic development, rather than merely achieving or retaining political power, has become the primary political issue. Despite the central role that India has played in overall Soviet policy in the Third World, the Soviets find themselves in a situation in which their long-term relevance for India's interests and concerns is likely to wane. As the threat to Indian security posed by both China and Pakistan has lessened and India's overall economic performance has expanded, the Soviets have found themselves in a weakened bargaining position. The Indian economy requires little that is available from the Soviet Union, except petroleum which in recent years has comprised more than two-thirds of total Indian imports from the USSR. Moreover, because of the improvements in its hard currency balance of payments situation the Indian government is able to purchase military equipment on the world market. The recent Soviet willingness to provide India with the most sophisticated weapons (MiG-29 aircraft not then in production in the USSR) on very favorable terms is evidence of a Soviet recognition

⁴ Kazimierz Poznanski, "Competition between Eastern Europe and Developing Countries in the Western Market for Manufactured Goods," in Joint Economic Committee, Congress of the United States, *East European Economies: Slow Growth in the 1980's. Volume 2: Foreign Trade and International Finance*, edited by John P. Hardt and Richard F. Kaufman. Washington: U.S. Government Printing Office, 1986, p. 67.

⁵ *Ibid.*, p. 85.

⁶ See Stephanie G. Neuman, "Third World Arms Production and the Global Arms Transfer System," in *Arms Production in Developing Countries: An Analysis of Decision Making*, ed. by James E. Katz. Lexington, MA/Toronto: Lexington Books, D.C. Heath, 1984, pp. 15, 37.

of the need to find ways to prevent the erosion of relations and to enhance their continuing relevance to India's needs.⁷

The economic difficulties faced by the USSR in dealing with the LDCs are not of such a nature as to drive the USSR out of the Third World. However, they mean that the Soviet ability to compete with the West will remain limited and that the Soviets will likely be forced to continue to focus on the least developed of the Third World states—those for whom access to any form of development assistance is still essential.

Even prior to Brezhnev's death in 1982 the Soviets were aware of these and other problems in their relations with developing countries and had begun serious reassessment of their policies.⁸ The importance of the reevaluation is most visible in the Party Program of the CPSU approved at the 27th Party Congress in March 1986. While the earlier 1961 program had spoken with great optimism about prospects for liberation and the role of the USSR in supporting the liberation struggle, the new program discusses in some detail the revitalized role of neo-colonialism and imperialism in the Third World and notes only that the "CPSU supports the just struggle waged by the countries of Asia, Africa and Latin America against imperialism. . . ." and that the "Soviet Union is on the side of the states and peoples repulsing the attacks of the aggressive forces of imperialism and upholding their freedom, independence and national dignity." Progressive states are informed that the tasks of building a new society are primarily their own responsibility, although the "Soviet Union has been doing and will continue to do all it can to render the peoples following that [socialist-oriented] road assistance in economic and cultural development, in training national personnel, in strengthening their defences and in other fields."⁹

What emerges from the recent discussions among Soviet analysts concerning the Third World and is even more evident from the authoritative pronouncements from the very top of the Party is the fact that the Third World is no longer given the central position in overall Soviet foreign policy that it received under Brezhnev. The results of the expanded Soviet activism in the Third World in the late 1970's were disappointing from a Soviet perspective. Moreover, the economic and political costs of that activism have become evident. The Soviets have entered a period in which they are empha-

⁷ See the recent articles by Jyotirmoy Banerjee, "Moscow's Indian Alliance," and Dilip Mukerjee, "Indo-Soviet Economic Ties," in *Problems of Communism*, XXXVI, No. 1 (1987), pp. 1-12, and 13-24.

⁸ Among the most important recent treatments of changing Soviet interpretations of the Third World are Francis Fukuyama, *Moscow's Post-Brezhnev Reassessment of the Third World*. Santa Monica, CA: The Rand Corporation, 1986, Report No. R-3337-USDP; Jerry F. Hough, *The Struggle for the Third World: Soviet Debates and American Options*. Washington: The Brookings Institution, 1986; Daniel S. Papp, *Soviet Perceptions of the Developing World in the 1980s: The Ideological Basis*. Lexington, MA/Toronto: Lexington Books, 1985; Elizabeth Kridl Valkenier, *The Soviet Union and the Third World: An Economic Bind*. New York: Praeger, 1983; Elizabeth Kridl Valkenier, "Revolutionary Change in the Third World: Recent Soviet Reassessments," *World Politics*, XXXVIII, no. 3 (1986), pp. 415-434; and Thomas J. Zamosny, "Moscow and the Third World: Recent Trends in Soviet Thinking," *Soviet Studies*, XXXVI (1984), pp. 223-235.

⁹ "Programma Kommunisticheskoi Partii Sovetskogo Soiuza. Novaia Redaktsiia," *Pravda*, 7 March 1986, p. 7; translated in *New Times*, no. 12 (31 March 1986), p. 43. The previous party program, published in 1981, had spoken of a "mighty wave of national liberation revolutions" that were "sweeping away the colonial system and undermining the foundations of imperialism." *Pravda*, 2 November 1961.

sizing the consolidation of the positions gained earlier in countries such as Angola, Ethiopia, and Vietnam. They are apparently not prepared to take on significant and costly new initiatives in the foreseeable future; however, they have not indicated that they are likely to consider withdrawing direct or indirect support for clients such as the puppet regimes in Afghanistan and Cambodia.

As a result of their support for revolutionary movements and governments the Soviets have obtained some important military advantages through access to basing facilities in strategically significant regions of Southeast Asia, Africa and the Middle East. However, most of their new clients are small, weak, and dependent upon continued Soviet security and economic support for their very existence. While this weakness represents an asset for the Soviets' ability to exert influence and even control, it also means that these countries soon became a substantial drain on Soviet resources. It has been estimated that the cost of supporting clients (including Eastern Europe) had reached somewhere between \$35 and \$46 billion dollars annually by 1980.¹⁰ During his brief tenure as CPSU General Secretary Iurii Andropov made a number of statements that appeared to question the benefits for the USSR of extensive involvement in the Third World. He made most clear that under his leadership the Soviet Union would not likely expand its economic commitments to socialist-oriented developing states when he stated: "We contribute also, to the extent of our ability, to economic development. But on the whole their economic development, just as the entire social progress of those countries, can be, of course, only the result of the work of their peoples and of a correct policy of their leadership."¹¹

The message of recent Soviet discussions about the Third World is that the Soviets are concerned about the staggering costs that the maintenance of their "empire" and about the inability of their weaker clients to achieve political and economic stability. They have already initiated efforts to divert some of the economic burden to their East European allies—with only limited success, given the problems facing most of these countries. Moreover, they have become increasingly selective in the amounts and types of support that they are willing to provide to existing clients.

Despite Soviet concerns about the cost of their involvement in the Third World and about the weakness and instability of most of their major Third World clients, there is no evidence that Gorbachev and his associates are likely to initiate a policy of withdrawal from prior commitments. Although the Soviets have refused to provide the economic and security backing required by the embattled Marxist regime in Mozambique, elsewhere they have continued to extend substantial new support to established Third World clients and allies. In Syria they have not only replenished the arsenal destroyed by the Israelis in the air war of 1982, but have also committed substantial numbers of Soviet military technicians to man the new equipment. In Afghanistan the Soviets have continued to

¹⁰ Charles Wolf, et al., *The Costs of the Soviet Empire*. Santa Monica, CA: The Rand Corporation, Nor. R-3073/1-NA, September 1983.

¹¹ Iurii Andropov, "Rech Generalnogo Sekretaria TsK KPSS Tovarishcha Iu.V. Andropova," *Kommunist*, no. 9 (1983), pp. 4-16.

pour in manpower and resources in an attempt to defeat or demoralize the mujahedin resistance and to stabilize the puppet communist government. They have maintained their support for Vietnam in the latter's attempts to pacify Cambodia, and have increased their overall assistance to Nicaragua since the beginning of the decade. Finally, as already noted they have agreed to provide India with a wide range of new weapons (including the licenses to produce advanced Soviet military aircraft) on very favorable terms, in order to forestall India's turning to the West for such equipment. Although the desire to reduce costs have been voiced increasingly, the immediate demands of retaining and consolidating the Soviet positions in the Third World have overridden this desire. Although they have been unwilling to make major new commitments—in part, most likely, because of the lack of opportunities, they have fulfilled and even expanded commitments made earlier.

The Soviets have also increased their efforts to improve relations with large capitalist states in the Third World. Their continued cultivation of relations with India is an example of this aspect of their policy, as have been their attempts to expand contacts with countries such as Brazil and Argentina, even when those countries were ruled by the military. Yet the problem that the Soviets face as they attempt to court these countries results from the relative lack of economic resources with which to compete with the West. In the 1970's they were able to capitalize on their major strength—the ability to provide security support—as they established close ties with a number of countries in Asia, Africa and the Middle East. As they try to expand relations with the large, basically stable, Third World states the overall weakness of their economy represents a major drawback. Not only do they lack the investment capital and the technology sought by these countries, but increasingly they are in competition with them for export markets in the West. Thus, prospects for Soviet success in this area are not at all clear.

SOVIET FOREIGN TRADE AND REVITALIZATION OF THE ECONOMY

The economic problems that the Soviets face in their relations with developing countries are indicative of the broader weaknesses of the Soviet economy which have been the focal point of Gorbachev's concerns since he assumed power. The "openness" [glasnost] in discussing problems and the efforts to revitalize the economic system that have characterized the post-Brezhnev era have resulted from the awareness by the new Soviet leadership of the complex set of political and economic issues that must be dealt with if the Soviet Union is going to retain and expand its position as a global power. Obviously there are numerous domestic factors that have influenced this shift in Soviet policy; yet it is evident as well that Soviet leaders recognize that over the long term their ability to compete with the West will decline—even in the area of military technology—if their economy does not keep pace with developments in the rest of the world.

Several important developments in Soviet foreign economic policy appear to be directly related to attempts to deal with some of these problems. For example, the major restructuring of the for-

eign trade mechanisms introduced effective 1 January 1987 is meant to overcome many of the inefficiencies that have characterized Soviet foreign trade in the past;¹² and the formal request submitted to GATT in August for observer status, the talks between the EEC and the CMEA for the expansion of direct ties, and the announcement of a Soviet willingness to permit joint ventures with the West appear to be part of an effort at creating more efficient and beneficial economic relations with the outside world.¹³ Although this effort is evidently related to long-term Soviet objectives of dealing with the structural problems that plague the Soviet economy by providing access to Western technology, quality control and management techniques; it also represents a pragmatic response to the recent dramatic deterioration in the foreign trade position of the USSR. The precipitous drop in oil prices, for example, cost the Soviets an estimated \$4 billion in 1985 and an additional \$3 billion in 1986, in comparison with hard currency earnings from petroleum of \$15.1 billion in 1984.¹⁴ Given the import requirements associated with Gorbachev's plans for economic revitalization, it is essential that the Soviets expand their export potential—in particular of industrial products.

The recent shift in Soviet views on the advisability of greater integration into the international economic system (assuming that it is more than a mere tactical manoeuvre) coincides with broader reassessments in the USSR of the nature of the international system and of Soviet foreign policy. The "new political thinking" in the foreign policy area that has been evident in Moscow in the past few years provides evidence of a growing awareness of the interrelatedness of domestic and foreign policy concerns. In his speech to the 27th Party Congress in early 1986 Gorbachev, for example, referred explicitly to the existence of global problems that can only be resolved by cooperation on a world-wide scale, to "the growing tendency towards interdependence of the states of the world community," and to the fact that Soviet and American security can be maintained only if it is mutual.¹⁵ These points have been elaborated more fully by Anatolii Dobrynin, the head of the International Department, in an article in the major Communist Party theoretical journal, who notes as well the need for a multifaceted approach to the solution of international problems that includes economic, political and humanitarian elements, as well as military means.¹⁶

It is still far too soon to determine whether Soviet reassessments of the nature of their foreign political and economic policies is likely to result in important changes in actual behavior. What one can say is that both academic analysts and decision makers in Moscow present a much more complex picture of the international system than that which characterized Soviet thought only a decade ago. An apparent awareness is emerging that the USSR is not able

¹² See Joan F. McIntyre, "Soviet Efforts to Revamp the Foreign Trade Sector," above, in this volume.

¹³ AP (Moscow), 22 August 1986 and AP (Moscow), 25 September 1986.

¹⁴ "Soviet Foreign Trade," *Background Brief*, Foreign and Commonwealth Office, London, December 1986.

¹⁵ M.S. Gorbachev, "Politicheskii doklad Tsentral'nogo Komiteta KPSS XXVII s'ezdu Kommunisticheskoi Partii Sovetskogo Soiuza," *Kommunist*, no. 4 (1986), pp. 17-19.

¹⁶ A. Dobrynin, "Za bez'iadernyi mir, navstrechu XXI veka," *Kommunist*, no. 9 (1986), pp. 24-25.

to remain isolated from the major developments—including economic developments—occurring throughout the world and that it must participate in them, if its role as a major power is to be protected. Whether Gorbachev's "new political thinking" will emerge and remain the dominant view in Moscow and whether it will result in major changes in Soviet international behavior are questions that will be answered only by the passage of time.¹⁷

¹⁷ For treatments of the impact of Gorbachev on Soviet foreign policy see Driitri K. Simes, "Gorbachev: A New Foreign Policy?" *Foreign Affairs*, LXV (1986), pp. 477-500; Harry Gelman, "Gorbachev's Dilemmas and His Conflicting Foreign-Policy Goals," *Orbis*, XXX (1986), pp. 231-248; Heinz Timmermann, "Gorbatschows aussenpolitische Leitlinien: Die internationalen Beziehungen Moskaus auf dem 27. Parteitag der KPdSU," *Berichte des Bundesinstituts für ostwissenschaftliche und internationale Studien*, no. 13 (1986); Bohdan Nahaylo, "New Pragmatism in Soviet Foreign Policy?" Radio Free Europe/Radio Liberty, *Radio Liberty Research Bulletin*, RL 369/86, Sept. 27, 1986; and Charles Glickham, "New Directions for Soviet Foreign Policy," Radio Free Europe/Radio Liberty, *Radio Liberty Research Bulletin*, RL Supplement 2/86, Sept. 6, 1986.

COMMENTARY

By Charles Wolf, Jr.*

Foreign policy and foreign economic policy are usually closely intertwined. In the Soviet case, the connections are distinctive, as well as close. Moreover, the connections are, for a number of reasons, likely to be even closer in the immediate future than in the past.

The connections between the Soviet Union's foreign economic policy and its foreign policy arise in several different areas:

1. Soviet hard currency earnings are currently severely constrained, and are likely to remain so in the coming years. Consequently, the Soviet Union is likely to want to sustain its access to the international capital market for hard currency borrowing. It would not be surprising if such borrowings were to average between 5 and 10 billion dollars per year during the next decade.

Several considerations underlie this judgment. The Soviet Union's largest source of hard currency earnings, namely those from oil and gas exports, will probably be under pressure from both sides of the market: from the higher real costs of Soviet supply; and from moderately soft demand, and flat real prices in world markets. This latter conjecture is more uncertain than the preceding one. On the one hand, the recently reported doubling in the size of Venezuela's commercially exploitable oil reserves, or possible resolution of the Iran-Iraq war may, separately or in combination, substantially boost world oil supplies, thereby exerting a downward influence on prices. Moreover, if superconductivity becomes commercially feasible, the increased efficiency of power transmission may also exercise downward pressure on energy prices. Anticipation of this prospect could have a similar effect.

On the other hand, if more rapid economic growth occurs in the developed countries, in the newly industrializing and in some of the developing countries, the result may be a rise in world oil demand and upward pressure on oil prices. And the outbreak of conflict or instability in some of the major oil producing countries could also push prices up.

The Soviet Union's second principal source of hard currency earnings—namely, weapons sales—will probably also be under severe pressure due to increasingly active competition from other suppliers in the newly industrializing countries (NICs), such as Brazil and South Korea, and in Western Europe, and to curtailed hard-currency demand. While the Soviets may sustain or even increase their total weapons deliveries in the third world, if such a flow occurs it is likely to require increased subsidization, and hence

*The author is director of international economic policy research at The RAND Corporation, and dean of RAND's Graduate School.

to result in lower Soviet net hard currency revenues. Instead of achieving military sales equal to or greater than the volume of subsidized (i.e., "aid") deliveries, as in 1982 and 1983, the hard currency sales portion of Soviet military exports is likely to decrease.¹

Stressed as its hard currency earnings will probably be, yet needing hard currency borrowing from the West and Japan, Soviet foreign policy toward these current and potential creditors is likely to be at least partly hostage to the dictates or desiderata of foreign economic relations.

2. Another dilemma facing Soviet foreign economic policy is posed by the conflicting forces impinging on Soviet economic relations with Eastern Europe. On the one hand, the Soviet Union seeks to tie the East European members of the Council for Mutual Economic Assistance (CMEA) more closely to itself, as well as to the other CMEA members. This aim is reflected in the enormous growth in both the number and specificity of Specialization Agreements concluded with the CMEA members in the past several years; the number of such Agreements has risen to over three hundred.²

On the other hand, the East European countries themselves, especially Hungary, East Germany, and perhaps Poland, are strongly drawn toward expanded trade, credit, and investment relations with the West.

To resolve these conflicting influences, the Soviet Union is likely to utilize a combination of carrot and stick: foreign policy and military policy representing the stick, and foreign economic policy providing the carrot, in the form of financial inducements designed to keep the East Europeans from straying too far. Consequently, although the costs to the Soviet Union of its empire in Eastern Europe have considerably decreased in the first half of the 1980's compared with the previous decade—largely through eliminating the substantial implicit subsidies on Soviet oil exports to Eastern Europe—the net costs probably won't shrink to zero. Instead, while reduced in total size, these costs are likely to take over forms to further the Soviets' purpose: export credits, implicit subsidies on some imports by the Soviet Union from Eastern Europe, and subsidization of Soviet military equipment transfers.³

3. Finally, connections between Soviet foreign policy and Soviet foreign economic policy are prominent, as well as puzzling, in a third area: namely, that of the extended Soviet empire beyond the contiguous East European members of the CMEA.

The Soviet Union is an empire in a traditional and general sense, as well as in a special sense unique to itself. The general sense of the term implies a special degree of influence, control, or constraint exercised or imposed by the imperial power over the component parts. That this control varies widely across the different parts of the Soviet empire is no more peculiar to it than to the Roman, Ottoman, British or Japanese empires of the past.

¹ See Charles Wolf, Jr., Keith Crane, K. C. Yeh, et al., "The Costs and Benefits of the Soviet Empire, 1981-1983", August, 1986, The RAND Corporation, R-3419-NA, p. 7.

² See Keith Crane and Deborah Skoller, "The Effectiveness of Specialization Agreements Within the CMEA," July 1987, The RAND Corporation, R-3518.

³ See Wolf, et al., "The Costs and Benefits of the Soviet Empire", op cit, pp. 42-46.

The Soviet empire also has certain distinctive attributes, including the fact that the imperial power is usually exercised through the Communist Party of the Soviet Union in conjunction with the counterpart communist parties of the other parts of the empire, rather than through formal governmental channels. Thus, the International Department of the CPSU typically plays a more active and important role than the Soviet Foreign Ministry.⁴

The total economic costs of the Soviet empire, including both the contiguous components in Eastern Europe and the Third World components abroad, as a proportion of Soviet ruble GNP have declined sharply from a peak of about 7 percent in 1980. Nevertheless, these empire costs were still quite substantial in 1983—the most recent year for which detailed estimates have been made—amounting to approximately 4 percent of Soviet ruble GNP, representing about 30 percent as much as Soviet military spending in that year.⁵

It is also worth noting that during the first part of the 1980's, the regional distribution of Soviet empire costs shifted quite sharply in dollar terms. While the burden on the Soviet economy imposed by the empire fell in absolute as well as relative terms, the proportion spent in Eastern Europe fell from about 64 percent in 1980 to 52 percent in 1983. At the same time the share incurred in Vietnam and Cuba rose from 17 percent to 28 percent, while the share of total empire costs incurred in Afghanistan and other third world countries remained at about 20% during the period. Thus, by 1983, 48 percent of total empire costs in dollars were incurred in the third world compared to only 36 percent at the end of the 1970's decade. The regional distribution of Soviet empire costs is shown in the following table.

TABLE 1.—REGIONAL DISTRIBUTION OF EMPIRE COSTS, 1976–83

(In billions of current U.S. dollars and percentage shares)¹

	1976	1980	1982	1983
Eastern Europe (Warsaw Pact and CMEA)	7.39–8.58	20.61–25.84	14.84–19.17	10.76–15.11
Percent	(64.5–67.9)	(61.9–65.9)	(51.8–56.6)	(49.4–55.6)
Trade subsidies	4.41–5.60	16.48–21.71	10.45–14.78	6.51–10.86
Trade credits	1.17	2.81	3.17	2.76
Economic aid	1.81	1.32	1.22	1.49
Military aid				
Cuba, Vietnam, Mongolia (CMEA)	2.36	6.04	8.11	6.80
Percent	(18.7–20.6)	(15.4–18.1)	(23.9–28.4)	(25.0–31.2)
Trade subsidies	1.36	1.99	3.59	3.10
Trade credits	0.48	1.66	1.67	1.34
Economic aid	0.34	0.57	0.79	0.85
Military aid	0.18	1.82	2.06	1.51
Total CMEA	9.75–10.94	26.65–31.88	22.95–27.28	17.56–21.91
Percent	(85.2–86.6)	(80.0–81.2)	(80.2–80.5)	(80.6)
Afghanistan and other Third World countries	1.70	6.56–7.36	(5.65–6.60)	(4.23–5.28)

⁴ For a further discussion of other distinctive attributes characteristic of the Soviet empire, see Henry Rowen and Charles Wolf, Jr. (Editors), *The Future of the Soviet Empire*, Chapter 7, "The Costs and Benefits of the Soviet Empire", St. Martin's Press, 1987 (forthcoming).

⁵ See *ibid.*

TABLE 1.—REGIONAL DISTRIBUTION OF EMPIRE COSTS, 1976–83—Continued

(In billions of current U.S. dollars and percentage shares)¹

	1976	1980	1982	1983
Percent	(13.4–14.8)	(18.8–20.0)	(19.5–19.8)	(19.4)
Trade subsidies				
Trade credits	Negligible	1.62	1.90	2.19
Economic aid	0.24	0.28	0.52	0.68
Military aid	1.46	4.26	2.56	0.62
Military operations in Afghanistan		0.50–1.20	0.67–1.62	0.74–1.79
Total	11.45–12.64	33.31–39.24	28.60–33.88	21.79–27.19

¹ All figures are in billions of current dollars except where percentages are shown. Where percentage shares are indicated, the calculated ranges are derived as the ratio between the low end of the regional dollar estimate and the low end of total empire costs, and conversely, for the high end of the range. For an explanation of sources and methods of estimating the above figures, see Wolf, et al., RAND R-3419-NA, "The Costs and Benefits of the Soviet Empire," op. cit., p. 35.

One of the crucial questions about Soviet foreign policy for the remainder of the 1980s and the 1990s concerns Soviet policy toward the empire and the different consequences for the Soviet economy that will ensue depending on Soviet policy choices in this domain. The subject elicits quite different views and forecasts from various experts outside the Soviet Union,⁶ and probably among the members of the ruling class inside the Soviet Union, as well.

On the one hand, pointing to restrained and perhaps retrenched Soviet policy in this domain, are the serious resource constraints imposed by acute economic problems, decreased economic growth, declining total factor productivity, and intensified competition for resources, within the domestic Soviet economy. The severity of these problems has been dramatically underscored recently by the accumulated evidence and acerbic criticism of distortions and exaggerations which seem to have occurred in Soviet official statistics over the past six decades.⁷

The result is an evident preoccupation of the Soviet leadership with *perestroika*, and the acute domestic economic and social problems at home. Consequently, it is reasonable to anticipate Soviet reluctance to devote resources to expansion of the empire in the next several years, and perhaps even to maintaining the less important parts of the extended empire abroad.

On the other hand, there are some persuasive arguments that lead to less confidence in such a benign outlook for Soviet moves in the third world. For example, there is the fact that in the two years of Mr. Gorbachev's leadership as General Secretary, increased Soviet resources have been committed to Afghanistan, Nicaragua, and Angola, as well as to Cuba and Vietnam. And there remains the high value and central importance assigned to the expanding horizons of international Communism among the goals of the Soviet leadership. Vladimir Bukovsky gives this point particular emphasis:

Most importantly, the distant colonies . . . become the only tangible measure of success the Soviet system could produce—the only proof that Communist ideology is

⁶ For an example of the contrasts, see Chapter 4 by Frank Fukuyama, "The Political Character of the Overseas Empire", and Chapter 5 by Herbert J. Ellison, "Marxism-Leninism in the Third World", in Rowen-Wolf, op. cit.

⁷ See for example, V. Selyunin and G. Khanin, "Cunning Figures", *Novy Mir*, February 1987.

true and world revolution is still in the making . . . The inherent instability of Communist regimes drives them further on across the world in search of their next prey . . . even though it strains their economy, depletes their resources, and makes them vulnerable.⁸

In sum, allocating more or fewer resources to the empire is one of the major competing claims on the Soviet economy, as well as on the time and attention of the top leadership. The range and complexity of these allocative choices, as well as the competition between the domestic and international ones, can be summarized as follows:

1. Within the military, there is the choice between nuclear offensive and defensive forces, on the one hand, and between them and conventional weapons, especially higher technology ones, and those that are dual-capable, on the other.

2. Both between the military and the rest of the economy, and within the non-military sectors themselves, there is the further allocative choice between investing in expanded capacity in higher technology sectors—such as machine tools, electronics, and semiconductors, that can have military as well as non-military pay-offs—or in added capacity for producing consumer goods.

3. Within the consumption sector, there is the further issue of production for “private” consumption, (food, clothing, appliances, etc.), and “collective” consumption, (health, housing, etc.). Indeed, the health sector may warrant special consideration, not only or even principally because of the surprising deterioration of longevity and other vital health statistics in recent years, but because of repercussions from worsened health conditions on the vigor and productivity of labor in the economy as a whole.

4. Still other allocative issues arise in choosing between the preceding choices and those involving the Soviets’ crucial energy sector: whether, and to what extent, to meet the substantial resource demands of the energy sector for retrofitting the large number of Soviet graphite nuclear reactors, in light of Chernobyl, and for the rising extraction and transportation costs relating to oil, gas, and coal?

5. Finally, with respect to present and future empire costs, the leadership confronts the question of how much support to provide for the various parts of the extended Soviet empire, including Cuba, Vietnam, Angola, Nicaragua, Afghanistan, Cambodia, Mozambique, as well as for potential accessions to the empire, when and where promising opportunities may arise?

It is in the context of these pressing allocative choices, that the connections between Soviet foreign economic relations and Soviet foreign policy become critical. Thus, while the maintenance and continued expansion of the empire probably persists as a high priority claimant on Soviet resources, these resources are more tightly constrained in the later part of the 1980’s and the 1990’s than in the previous decade. Moreover, under these circumstances, the costs of empire as a burden on the Soviet economy are likely to display henceforth the same pattern that was manifest in the early

⁸ See Vladimir Bukovsky, Chapter 2, “The Political Condition of the Soviet Union”, in Rowen-Wolf, *op. cit.*

1980's: tighter controls, and more careful monitoring by the Soviet leadership.

In managing the imperial enterprise, Soviet behavior may be acutely ambivalent: on the one hand, placing greater emphasis on self-reliance by members of the empire and their diminished access to Soviet benefactions, while, on the other, retaining a willingness to devote resources to promising opportunities which may arise for the empire's expansion. Perhaps the Soviets will resolve this dilemma by applying more exacting criteria in the selection of opportunities.

The task of managing Soviet imperial operations can be likened to that of managing any large enterprise: limiting costs while furthering management's multiple and sometimes conflicting objectives. In times of "prosperity"—for example, the 1970's when oil prices were rising and hard currency earnings were high—management was more concerned with furthering its objectives than with limiting costs. In times of "recession"—for example, the 1980's—management will probably be more concerned with limiting costs.

COMMENTARY

By Heinrich Vogel*

The following comments concentrate on (1) the regional orientation of Soviet economic relations with industrialized countries (West vs. CMEA), (2) chances for a normalization, i.e. formation of a more predictable pattern of US policy governing economic and technological relations with the USSR, and (3) the political and economic environment within the Western alliance.

There is little doubt that Soviet foreign trade policies under the consecutive General Secretaries of the CPSU have never really considered a reduction in foreign trade exposure to the West (a) in spite of disappointment with tangible results from substantial imports of Western capital equipment and technology and (b) in spite of frustration over recurrent Western tendencies of "politicization" of trade relations by linkages and sanctions. To the contrary: the door to interdependence has been kept open and the most critical constraints to further development in relations with industrialized countries of the West are realistically identified primarily in weak competitiveness of Soviet industrial exports and in the development of terms-of-trade on world markets, aggravated by a "less developed" export structure which continues to earn most of the country's hard currency from energy sales. Soviet leaders today are more willing than their predecessors to envisage innovations in organizing foreign trade as is described in the papers by J. McIntyre and L.J. Brainard. (See chapter 1.) Risks are taken to be inherent in the transplantation of elements "alien" to the traditional system of central planning and control (joint ventures, direct foreign ties of export units, and new forms of borrowing abroad).

At the same time, and in response to a new assessment of risks in economic relations with the West, more weight is being given to partner-countries in CMEA which are certainly more reliable, but comparatively less efficient in terms of technological standards and organizational flexibility. This aspect (c.f. the CMEA Complex Program of Scientific-Technical Progress to the Year 2000 of December 18, 1985, and subsequent CMEA documents) was left out in the present volume's design, and the authors of this chapter are not to be blamed. Nevertheless, it will be useful to remember the facts of this "strategy of second best" in Soviet foreign trade policy, the political implications (the attempts to reduce points of critical dependency open to Western economic leverage), and the consequences: increased pressure on the economies in Eastern Europe, most of which are confronted with sizeable debt burdens or at least hard currency earning problems vis-a-vis the West; and at home,

*Director, Federal Institute for Eastern and International Studies, Köln, Federal Republic of Germany.

facing pressing needs for external help in capital and technology transfers to manage their modernization.

Gary Bertsch convincingly places his outlook on the future of US economic and technological relations with the USSR between two "unlikelies": neither full normalization nor a more restrictive policy are to be expected, rather a "combination of restrictive and facilitative impulses, reflecting the complex forces in the domestic and international environment". Volatility of orientation, combined with public sentiment that allies have to follow, no matter how extreme the oscillations, is bound to produce trouble in the alliance. Both well documented papers by Bertsch and Heiss reduce the prospects for change in US foreign trade and technology transfer policies to negligible levels. A statement like "any US-Soviet confrontation, however brief, has the potential to disrupt trade ties for a long time" (Heiss) must be taken into serious consideration by the bewildered adversary and the frustrated allies.

But is the reduced capability of consistent US policy on foreign economic relations with the USSR only due to great power rivalry, to the "nuisance value" of ethnic lobbies or intransigent strong believers, or the "antitrade character of American political culture" (Bertsch)? The very existence of concerns about cost/benefit distribution in economic relations with the USSR or about their security implications *per se* is no sufficient explanation for differences, even controversies with US allies in NATO. Such concerns are coming up no less in Western Europe—with different outcome, though. In addition, there are structural differences in the political and economic systems of Western countries which explain patterns of behavior in foreign economic policies; the foreign trade regime in the US restricts export activities as a privilege granted or suspended according to foreign policy considerations. In Western Europe, free trade is traditionally and constitutionally guaranteed, governmental interference as an exception is legally constrained to cases where military security is put in jeopardy by specific exports.

A second structural disposition favouring restrictive policies stems from the fact that there is no institution to take care of civilian industrial and technological policies in the US. The functions of MITI (Japan) or the BMFT (FRG) have in the US been conquered by the DoD which controls some 45 percent of total public expenditures for R&D of the country. As a consequence, defense policy criteria penetrate into fundamental and applied research and into industrial productions, militarized standards of secrecy are spreading, as has been made more widely known recently by the study of the National Academy of Sciences.

In this perspective, the potential for interference in the US is structurally increased, linked to changing assessments of relative strength in great power relations and strongly biased in favour of restrictive action—conditions which are missing in other Western industrial countries. Prospects of bridging the differences of this sort are minimal; neither diplomatic formulae of economic summits nor political arm-twisting will be capable of producing more coherent policies.

The consequence for all participants in East and West will be to take the incalculable into account with uncertainties further limiting the minimal scope for growth in economic relations.

